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GLOBAL DATA MONITORING REPORT

September 1998

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

N.B. 500 km SATEMs are no longer assimilated into the UKMO global Unified Model. Both 500 km and 120 km SATEMs were replaced on 16th April 1996 by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS (from NOAA-11 and NOAA-14).

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
6. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
7. January 1998. Increase in resolution of UKMO global forecast model.
8. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
9. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
10. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
11. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
12. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.| bias|	$\geq$ 4 hPa	(pressure),
	$\geq$ 5 m s^{-1}	(wind speed),
	$\geq$ 30 degrees	(direction).
2.SD	$\geq$ 6 hPa	(pressure),
	$\geq$ 80 degrees	(direction).
3.PGE	$\geq$ 25	

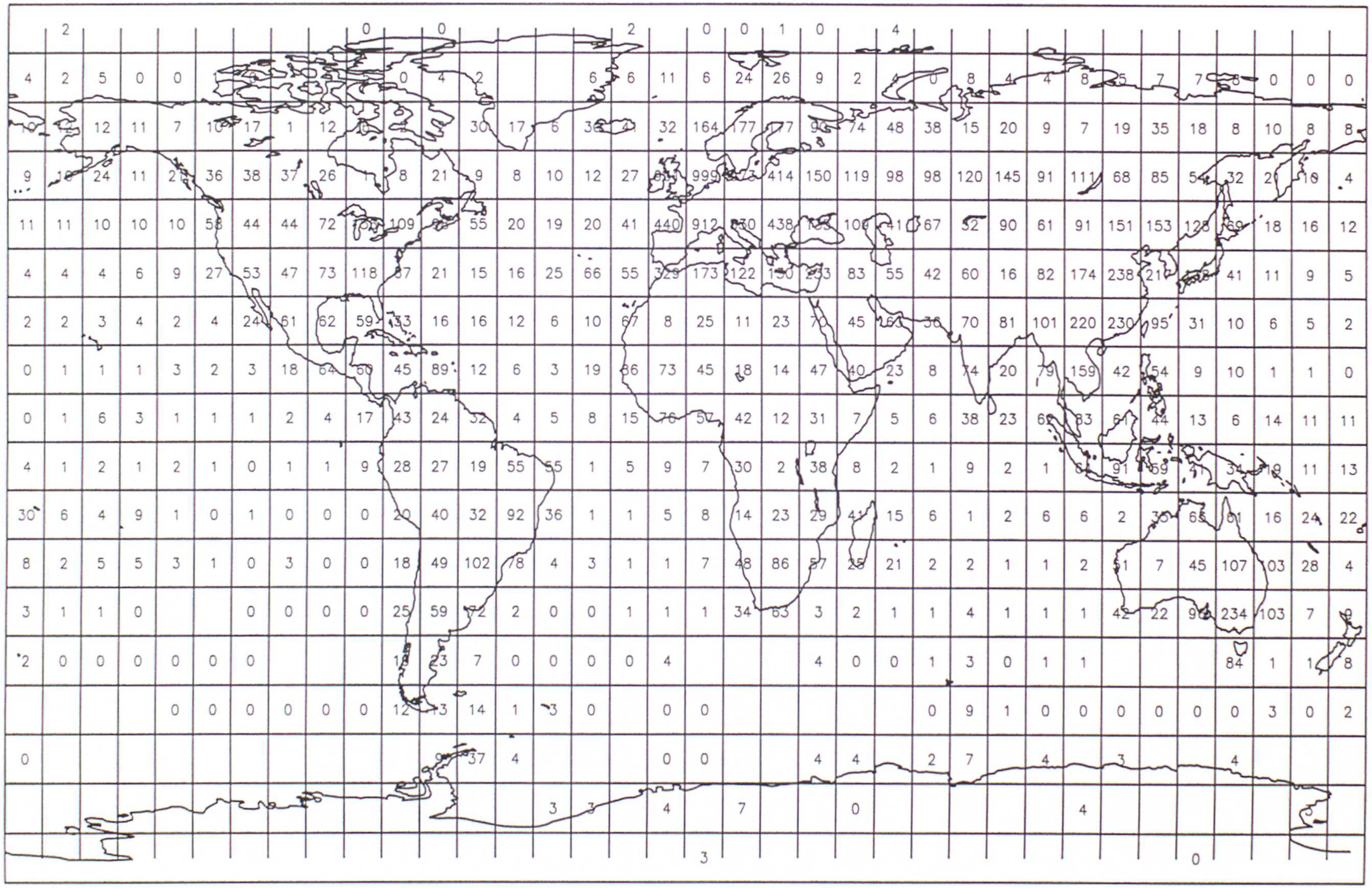
N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
FNIH	ALL	P	SUR	99	0	0	5.6	-4.2	7.1
LAXP4	ALL	P	SUR	31	0	0	2.2	-4.4	4.9
OZBW6	ALL	P	SUR	53	0	0	1.0	-4.3	4.4
P3YS5	ALL	P	SUR	84	0	0	1.6	4.4	4.7
UGGA	ALL	P	SUR	61	0	0	1.6	-5.2	5.4
VCTV	ALL	P	SUR	23	5	22	5.5	5.7	7.9
VGKM	ALL	P	SUR	24	22	92	0.2	-12.5	12.5
VRVI2	ALL	P	SUR	38	0	0	1.2	5.7	5.8
VVKJ	ALL	P	SUR	23	0	0	2.4	7.4	7.7
WCV7620	ALL	P	SUR	31	0	0	1.0	5.6	5.7
WDZB	ALL	P	SUR	48	0	0	1.1	-6.0	6.1
WFLH	ALL	P	SUR	44	0	0	1.4	-4.0	4.2
WRZU	ALL	P	SUR	21	0	0	9.0	-0.2	9.0
3ECI8	ALL	P	SUR	21	0	0	0.5	-5.0	5.0
3FGQ3	ALL	P	SUR	20	0	0	1.3	8.6	8.7
3FPB6	ALL	P	SUR	25	0	0	2.5	-4.3	5.0
WIND SPEED									
C6KE3	ALL	SPEED	SUR	40	0	0	3.2	8.1	8.7
DGDD	ALL	SPEED	SUR	82	2	2	4.9	9.7	10.9
DGOL	ALL	SPEED	SUR	23	0	0	5.9	7.4	9.5
DQVK	ALL	SPEED	SUR	111	0	0	5.3	6.1	8.1
DUXW	ALL	SPEED	SUR	32	0	0	4.2	5.8	7.2
ELMG2	ALL	SPEED	SUR	20	0	0	3.2	7.6	8.3
FNVA	ALL	SPEED	SUR	42	0	0	2.4	5.0	5.5
GYZW	ALL	SPEED	SUR	56	1	2	5.9	5.8	8.3
OYCZ	ALL	SPEED	SUR	40	1	2	7.3	9.0	11.5
PCSS	ALL	SPEED	SUR	31	0	0	5.9	7.8	9.8
PJOX	ALL	SPEED	SUR	87	2	2	4.7	7.3	8.6
SXYY	ALL	SPEED	SUR	46	0	0	5.3	6.2	8.1
SYMK	ALL	SPEED	SUR	78	1	1	2.2	5.1	5.6
S6BO	ALL	SPEED	SUR	36	0	0	2.5	5.0	5.6
VRUM3	ALL	SPEED	SUR	60	0	0	3.6	5.4	6.5
3FLU7	ALL	SPEED	SUR	37	1	3	3.5	6.3	7.2
9MBK	ALL	SPEED	SUR	27	0	0	6.1	8.2	10.2
WIND DIRECTION									
C6MY6	ALL	DIRN.	SUR	40	0	0	27.7	-30.5	41.2
DACF	ALL	DIRN.	SUR	263	8	3	85.4	2.5	85.4
GBSA	ALL	DIRN.	SUR	24	0	0	89.3	-76.6	117.6
VRVI2	ALL	DIRN.	SUR	25	0	0	30.0	-32.9	44.5
46147	ALL	DIRN.	SUR	316	0	0	15.4	-30.3	34.0
46181	ALL	DIRN.	SUR	20	0	0	45.0	33.9	56.3
63104	ALL	DIRN.	SUR	63	0	0	86.7	90.0	125.0
63112	ALL	DIRN.	SUR	30	0	0	90.1	50.8	103.5

AVAILABILITY – SHIP/SYNOP – SEPTEMBER 1998

FIGURE 1

MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 20739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9 10 24 11 21 36 38 37 26 1 8 21 9 8 10 12 27 999 414 150 119 98 98 120 145 91 111 68 85 54 32 21 10 4
11 11 10 10 10 58 44 44 72 109 55 20 19 20 41 440 912 830 438 109 41 67 52 90 61 91 151 153 128 69 18 16 12
4 4 4 6 9 27 53 47 73 118 87 21 15 16 25 66 55 329 173 122 150 253 83 55 42 60 16 82 174 238 217 41 11 9 5
2 2 3 4 2 4 24 61 62 59 133 16 16 12 6 10 67 8 25 11 23 70 45 163 36 70 81 101 220 230 95 31 10 6 5 2
0 1 1 1 3 2 3 18 64 60 45 89 12 6 3 19 86 73 45 18 14 47 40 23 8 74 20 79 159 42 54 9 10 1 1 0
0 1 6 3 1 1 1 2 4 17 43 24 32 4 5 8 15 76 57 42 12 31 7 5 6 38 23 69 83 61 44 13 6 14 11 11
4 1 2 1 2 1 0 1 1 9 28 27 19 55 55 1 5 9 7 30 2 38 8 2 1 9 2 1 91 59 41 34 19 11 13
30 6 4 9 1 0 1 0 0 0 20 40 32 92 36 1 1 5 8 14 23 29 41 15 6 1 2 6 6 2 35 65 61 16 24 22
8 2 5 5 3 1 0 3 0 0 18 49 102 78 4 3 1 1 7 48 86 57 25 21 2 2 1 1 2 51 7 45 107 103 28 4
3 1 1 0 0 0 0 0 25 59 72 2 0 0 1 1 1 34 63 3 2 1 1 4 1 1 1 42 22 96 234 103 7 9
2 0 0 0 0 0 0 19 23 7 0 0 0 0 4 4 0 0 1 3 0 1 1 84 1 1 8
0 0 0 0 0 0 12 13 14 1 3 0 0 0 0 9 1 0 0 0 0 0 0 3 0 2
0 9 37 4 0 0 4 4 2 7 4 3 4
3 3 4 7 0 4 3
3 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoys.
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees).
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa :25 m s^{-1}	(pressure) (vector wind)

SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.| bias|	≥ 4 hPa ≥ 5 m s^{-1} ≥ 30 degrees	(pressure), (wind speed), (direction).
	2.SD	≥ 6 hPa ≥ 80 degrees	(pressure), (direction).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
33947	-40.5	-22.1	ALL	P	SUR	174	2	1	6.3	-0.2	6.3
46559	21.1	-131.4	ALL	P	SUR	210	0	0	1.0	-5.2	5.3
46922	26.1	-136.6	ALL	P	SUR	503	0	0	3.8	4.6	5.9
46960	20.3	162.8	ALL	P	SUR	139	0	0	1.7	-10.4	10.5
48533	78.7	-151.7	ALL	P	SUR	355	96	27	2.6	-0.5	2.6
48576	79.4	-163.0	ALL	P	SUR	37	37	100	0.0	0.0	0.0
66512	59.5	20.0	ALL	P	SUR	386	317	82	2.1	-11.8	12.0
WIND SPEED											
31531	-35.6	-45.9	ALL	SPEED	SUR	79	0	0	3.5	-5.2	6.3
41502	21.3	-44.4	ALL	SPEED	SUR	203	0	0	2.0	-5.8	6.2
62758	44.6	-23.9	ALL	SPEED	SUR	190	1	1	6.9	-6.9	9.7
WIND DIRECTION											
46540	37.9	-142.9	ALL	DIRN.	SUR	284	0	0	29.9	-32.4	44.1
46551	41.2	-159.6	ALL	DIRN.	SUR	22	0	0	28.4	-40.2	49.2
46560	41.0	-137.2	ALL	DIRN.	SUR	307	0	0	44.8	-100.8	110.3
46606	35.5	-144.6	ALL	DIRN.	SUR	108	0	0	39.3	45.3	60.0
52522	11.8	141.0	ALL	DIRN.	SUR	23	0	0	82.8	0.3	82.8
52534	10.1	125.7	ALL	DIRN.	SUR	106	0	0	138.4	4.2	138.5

AVAILABILITY – DRIFTER – SEPTEMBER 1998

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 5745

FIGURE 2

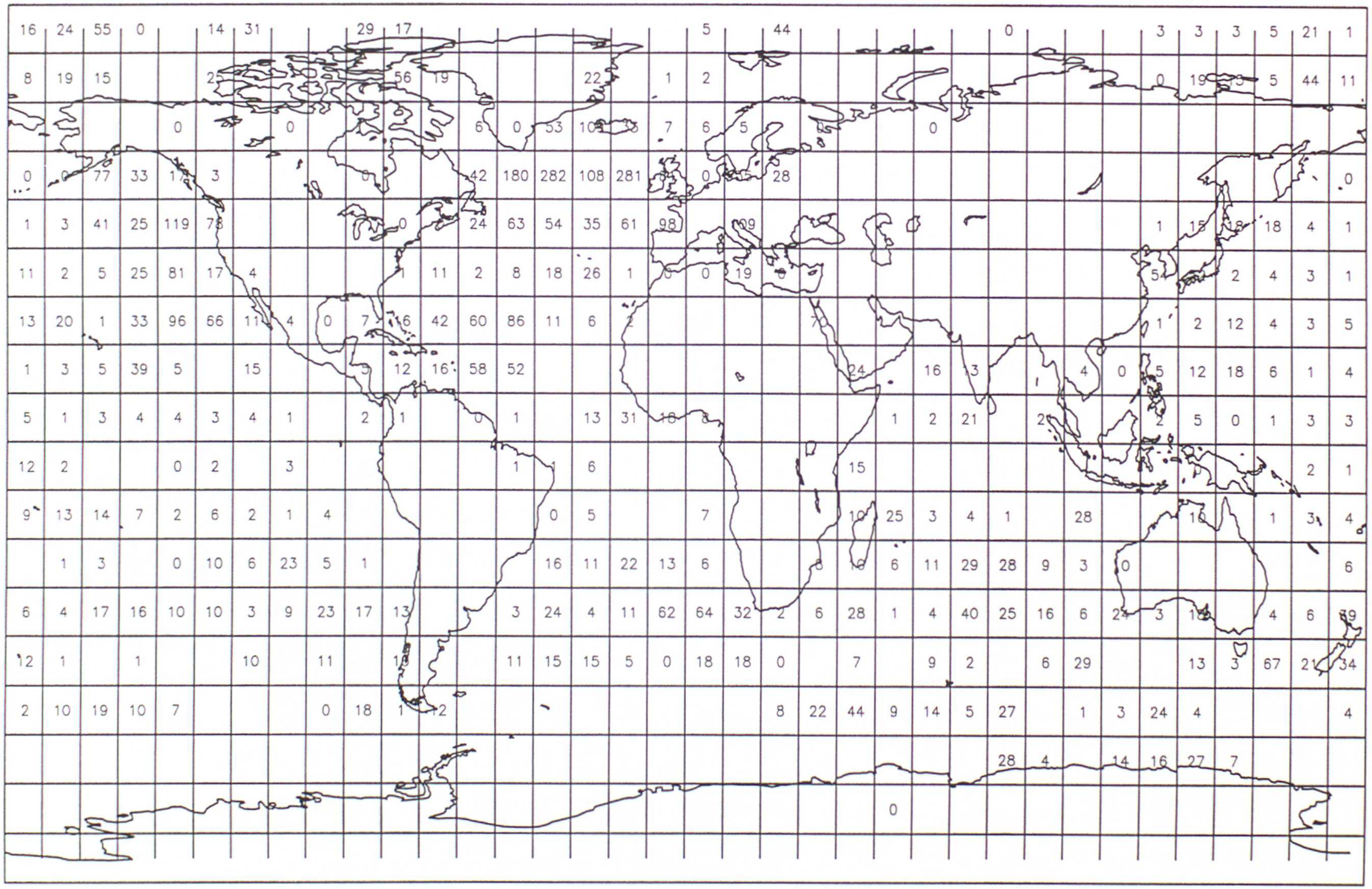


TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.| bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60010	28.3N	16.5W	2367	S7	86	0	0	36	1.4	-5.7	5.9
60445	36.2N	5.4E	1081	S8	117	1	1	1	0.9	4.4	4.5
60468	35.6N	6.2E	1052	S8	80	80	100	0	0.0	0.0	0.0
60511	35.3N	1.4E	1127	S8	112	60	54	0	0.6	14.2	14.2
60535	34.7N	3.3E	1144	S8	87	0	0	1	1.1	-5.7	5.8
60571	31.6N	2.2W	773	S8	110	0	0	0	0.9	-4.1	4.2
60670	24.6N	9.5E	1054	S8	109	2	2	3	1.5	9.0	9.1
63330	13.5N	39.5E	2070	MS	33	33	100	0	0.0	0.0	0.0
63334	10.3N	37.7E	2515	MS	32	0	0	3	0.7	10.2	10.2
63402	7.7N	36.8E	1725	MS	56	1	2	0	0.8	7.1	7.1
63450	9.0N	38.8E	2354	MS	59	1	2	0	0.6	4.7	4.7
63471	9.6N	41.9E	1260	MS	55	0	0	2	1.2	10.2	10.3
68030	18.5S	25.6E	1071	8	25	0	0	12	1.0	4.1	4.2
68343	27.6S	25.6E	1228	S8	79	0	0	100	1.0	-9.2	9.3
68396	26.5S	31.3E	641	S8	48	1	2	2	1.3	4.0	4.2
68442	29.1S	26.3E	1359	S8	107	0	0	93	1.0	-4.8	4.9
69679	43.9N	18.3E	1557	MS	37	37	100	0	0.0	0.0	0.0

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30320	56.9N	105.7E	669	MS	113	56	50	0	1.2	0.6	1.3
30554	54.5N	113.6E	995	MS	116	1	1	52	4.6	5.5	7.2
38750	37.5N	53.6E	-22	MS	83	0	0	49	3.1	-5.1	6.0
40743	36.2N	57.7E	941	MS	109	0	0	0	0.8	-4.7	4.8
40762	35.3N	59.2E	1333	MS	106	6	6	1	0.8	-13.5	13.5
41254	23.1N	57.7E	1755	S8	81	81	100	0	0.0	0.0	0.0
41396	16.0N	48.9E	700	MS	20	0	0	80	1.2	5.8	5.9
41535	34.2N	73.3E	1308	8	36	2	6	3	0.7	-5.4	5.4
44416	28.6N	81.6E	720	MS	31	2	6	6	1.9	4.7	5.1
44477	27.0N	87.4E	1445	S8	50	49	98	0	0.0	3.2	3.2
52602	38.8N	93.4E	2734	S	119	0	0	0	1.2	-6.1	6.2
53588	39.0N	113.5E	2898	S	119	119	100	0	0.0	0.0	0.0
54587	39.1N	123.2E	-9999	M	108	2	2	3	1.2	-4.6	4.8
56144	31.8N	98.6E	3184	S	106	4	4	0	1.2	-4.5	4.7
56385	29.5N	103.3E	3049	S	119	0	0	0	1.6	-4.8	5.1
56444	28.5N	98.9E	3488	S	118	85	72	22	0.6	13.7	13.7
56462	29.0N	101.5E	2994	S	107	1	1	0	1.3	8.3	8.4
56954	22.6N	99.9E	1054	M	119	0	0	2	0.9	4.2	4.3

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	38	0	0	0	1.4	-5.4	5.6
82704	7.6S	72.7W	170	MS	59	0	0	0	1.5	-4.4	4.6
83214	10.3S	54.9W	285	MS	46	0	0	2	1.7	-6.6	6.8
83235	12.4S	46.4W	604	MS	67	0	0	0	0.8	6.2	6.3
83319	14.7S	52.4W	315	MS	47	0	0	0	1.1	-4.8	4.9
83332	14.1S	46.4W	826	MS	64	3	5	0	1.0	13.2	13.2
83408	14.3S	43.8W	447	MS	63	0	0	0	0.8	10.1	10.1
83423	16.7S	49.3W	741	MS	67	0	0	0	1.0	-5.4	5.5
83488	17.8S	42.9W	1097	MS	61	61	100	0	0.0	0.0	0.0
83531	18.6S	46.5W	940	MS	67	0	0	0	1.0	-7.2	7.3
83587	19.9S	43.9W	850	MS	66	0	0	0	1.1	-7.2	7.3
83773	23.1S	48.9W	793	S	38	0	0	0	1.1	-7.4	7.5
84401	5.2S	80.6W	49	MS	63	0	0	0	1.6	5.1	5.3
84455	6.5S	76.4W	281	MS	50	1	2	2	2.0	5.7	6.0
84472	7.1S	78.5W	2620	S	34	0	0	0	0.8	-6.5	6.5

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
84628	12.0S	77.1W	12	MS	84	0	0	0	0.8	4.0	4.1
84686	13.6S	72.0W	3248	S	61	1	2	0	1.3	-7.2	7.3
84735	15.5S	70.2W	3826	S	45	0	0	0	0.9	-4.4	4.5
84782	18.1S	70.3W	468	MS	64	0	0	0	1.4	7.9	8.0
85312	19.8S	63.9W	992	S	29	28	97	0	0.0	-14.4	14.4
85406	18.3S	70.3W	55	M	118	1	1	1	1.5	5.5	5.7

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
70264	63.3N	149.1W	734	S	31	2	6	77	7.0	1.7	7.2
76118	30.4N	109.7W	1040	MS	42	0	0	0	0.9	-9.3	9.3
76551	21.5N	106.6W	4	MS	46	0	0	0	1.6	7.3	7.5
76625	20.6N	100.4W	1813	MS	52	0	0	0	1.4	-7.1	7.2
76632	20.1N	98.7W	2417	MS	28	0	0	0	0.6	-5.2	5.2
76658	19.2N	103.7W	494	MS	44	0	0	0	1.1	7.4	7.5
76698	19.6N	88.0W	20	MS	83	0	0	1	1.6	-6.3	6.5
76762	17.5N	99.5W	1865	MS	67	66	99	0	0.0	0.2	0.2
76775	17.1N	96.7W	1550	MS	56	0	0	0	1.0	4.7	4.8
76840	16.2N	93.9W	64	MS	91	0	0	9	1.4	4.2	4.4
76845	16.7N	92.6W	2276	MS	96	92	96	0	3.8	12.2	12.8
78718	14.4N	87.6W	626	MS	64	32	50	0	0.6	-14.0	14.0

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94328	22.4S	133.6E	623	MS	94	0	0	0	0.9	6.4	6.5
94955	41.6S	145.7E	684	MS	115	115	100	0	0.0	0.0	0.0
95952	41.9S	145.6E	560	MS	87	87	100	0	0.0	0.0	0.0

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
02045	67.8N	20.4E	408	M	99	99	100	0	0.0	0.0	0.0
11180	47.7N	15.8E	1546	S8	117	0	0	0	1.0	-4.0	4.1
16227	41.9N	13.6E	655	MS	246	207	84	0	0.9	-13.2	13.2
16614	40.4N	21.3E	604	MS	93	0	0	0	1.0	-6.5	6.6
17092	39.8N	39.5E	1218	S8	116	0	0	1	1.4	6.6	6.7
17203	38.9N	40.5E	1177	S8	112	0	0	0	1.0	4.1	4.2

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89264	71.4S	68.9W	780	S	244	1	0	0	2.8	5.2	5.9
89345	81.7S	148.8W	620	S	371	71	19	6	3.9	-8.2	9.1
89816	66.7S	112.9E	1375	S	216	0	0	2	2.2	-4.1	4.7

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	124	2	21	1.8	0.4	122	0	22	0	8.9	1.3
AAH	80	0	15	1.4	0.0	80	0	16	0	7.9	1.4
AAL	6017	1	30	1.7	0.1	5131	0	24	0	7.8	0.8
AAR	1404	1	8	1.7	-0.6	1385	0	8	0	8.2	0.6
ACA	1049	1	11	1.9	0.0	987	0	8	0	7.8	0.0
ACI	86	1	45	1.5	0.4	86	0	44	0	8.1	2.3
AEA	589	2	24	2.8	1.4	504	0	18	0	8.2	1.0
AEL	731	1	16	1.7	-0.4	714	0	17	0	8.9	0.5
AEY	98	0	4	1.5	0.6	94	0	6	0	7.0	0.5
AFL	503	0	6	2.3	1.1	474	0	4	0	8.6	0.3
AFR	1746	1	11	1.9	0.2	1652	0	11	0	8.4	1.2
AIH	206	1	12	1.6	0.1	165	0	7	0	9.5	1.6
AJM	89	0	6	2.3	-0.6	72	0	4	0	10.4	-1.3
AMT	842	0	45	1.9	1.3	822	0	47	0	6.7	1.3
AMX	312	2	7	2.0	0.0	311	1	5	0	9.4	0.7
ANA	1233	0	5	1.7	-0.2	1209	0	5	0	7.6	0.8
ANZ	3501	1	38	1.8	-0.1	3459	0	37	0	7.9	0.7
AOM	747	1	8	1.7	0.9	683	0	7	0	8.2	0.7
ARG	65	3	20	3.1	0.1	66	0	23	0	14.9	3.5
ASY	21	0	43	1.7	0.8	21	0	43	0	7.5	3.0
AVA	436	0	2	1.7	0.1	434	0	3	0	9.0	1.0
AVN	74	3	5	1.3	0.1	73	0	5	0	12.2	-0.5
AXA	154	1	47	1.9	-0.2	153	0	46	0	9.8	0.9
AZA	457	2	25	2.0	-0.2	351	0	16	0	8.1	0.7
BAL	814	0	13	1.4	-0.3	807	0	14	0	7.9	0.5
BAW	2051	0	22	2.0	0.0	1764	0	16	0	8.3	0.9
BBB	22	0	5	1.4	0.0	21	0	5	0	6.0	0.3
BWA	382	0	16	2.2	1.6	327	0	11	0	7.4	1.0
CAL	2171	1	7	1.5	-0.1	2170	0	8	0	9.0	0.4
CCA	255	1	10	2.3	0.6	270	1	73	0	11.0	-0.2
CDN	2685	1	11	1.8	0.1	2564	0	9	0	8.0	0.2
CES	428	1	7	1.2	0.0	432	0	10	0	9.3	0.1
CFG	1047	1	8	1.9	-1.1	990	0	6	0	8.6	0.6
CKS	517	1	46	1.5	0.4	499	0	45	0	5.5	0.8
CKT	199	1	18	1.7	0.7	177	1	15	0	9.6	0.3
CLX	380	1	10	2.0	-0.6	348	0	7	0	7.5	0.6
CMI	493	0	6	2.0	0.7	487	0	6	0	8.7	1.3
CMM	524	0	13	1.7	-0.1	496	0	10	0	7.1	0.5
COA	1694	1	35	1.7	0.1	1508	0	32	0	9.8	1.9
CPA	85	1	2	1.6	-0.6	82	0	2	0	6.6	0.7
CRL	498	1	8	1.3	0.5	468	0	9	0	7.6	0.9
CSA	44	2	18	1.3	-0.4	32	0	13	0	6.9	-0.8
CSN	85	1	11	2.0	0.9	84	0	8	0	8.5	0.0
CTB	375	0	2	1.8	-0.5	378	1	3	0	7.5	0.3
CTM	55	5	24	3.1	-1.3	55	0	15	0	8.5	1.4
CUB	538	1	10	2.5	1.5	511	0	11	0	11.1	1.9
DAF	23	0	0	1.6	-0.9	24	0	4	0	8.4	2.0
DAL	5823	1	41	2.0	0.5	4769	0	35	0	7.4	0.7
DBY	275	0	4	1.5	-0.8	277	0	4	0	7.5	0.8
DHL	209	9	100	5.4	-3.7	173	0	16	0	11.0	2.3
DLH	2963	0	17	1.9	0.0	2696	0	12	0	8.1	0.7
EIA	319	1	32	1.8	0.3	323	0	33	0	9.7	0.9
EIN	22	0	9	1.7	0.1	24	0	4	0	6.5	0.0
ELY	166	0	11	1.7	0.1	165	0	33	0	9.5	1.0
EVA	2503	0	6	1.5	-0.4	2501	0	7	0	8.4	0.4
EWW	95	0	17	2.5	1.0	83	0	100	0	13.0	2.9
FDX	1347	0	21	1.7	0.5	1259	0	19	0	8.3	0.2
FIN	419	0	21	2.0	0.6	332	0	9	0	6.8	0.9
FJI	888	4	42	1.7	0.0	853	0	41	0	8.9	1.0

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FOM	215	4	46	1.7	-0.1	209	2	45	0	8.2	1.8
GAF	112	0	36	2.6	0.8	78	0	21	0	9.7	1.5
GCO	44	0	25	1.8	1.2	46	0	22	0	4.7	-0.1
GHA	70	1	1	1.4	0.6	54	0	6	0	9.4	1.1
GIA	42	0	24	1.6	1.0	44	0	25	0	6.7	0.2
GRL	43	0	0	1.5	0.0	43	0	0	0	4.9	-0.8
GTI	82	0	16	1.9	0.4	77	0	10	0	10.9	-0.3
HAL	3169	0	39	1.3	0.2	3123	0	39	0	7.7	1.3
HBI	30	0	13	1.8	0.7	28	0	14	0	9.2	1.8
HLF	108	3	22	1.8	-1.0	96	0	13	0	8.7	0.2
HLQ	20	5	5	1.6	0.4	20	0	0	0	6.6	-0.7
HRH	90	1	56	1.8	0.2	88	1	57	0	12.6	1.5
IBE	3007	2	22	2.0	0.5	2732	0	17	0	8.7	0.6
ICE	968	1	49	1.9	0.0	764	0	16	0	8.2	0.5
JAL	7348	1	6	1.7	0.2	7236	0	6	0	7.6	0.7
JAZ	58	2	2	1.2	0.9	58	0	0	0	6.6	0.4
JKK	311	1	30	2.0	0.0	252	0	23	0	9.0	1.9
KAL	3685	1	8	1.5	-0.3	3644	0	9	0	8.5	0.5
KIW	29	10	41	3.2	2.6	27	0	33	0	8.0	-0.2
KLM	3263	1	21	1.7	0.1	3090	0	20	0	8.2	0.7
LAN	44	5	20	3.6	-0.9	44	0	18	0	14.5	4.4
LAP	43	16	40	4.6	-1.2	43	5	100	0	24.9	10.9
LDA	112	0	21	1.5	-0.6	105	0	19	0	9.0	1.4
LDI	355	4	29	2.7	-0.1	316	0	19	0	9.2	0.3
LEI	168	1	13	1.5	0.3	148	0	5	0	7.0	1.1
LIB	309	0	3	1.6	1.0	302	0	5	0	7.5	0.8
LOT	188	0	20	2.4	-1.1	152	0	10	0	7.1	0.2
LTU	916	1	25	1.8	-0.1	759	0	16	0	8.6	0.7
LXR	190	1	13	1.8	1.0	176	1	18	0	11.0	1.9
MAS	424	1	10	1.7	0.0	419	0	9	0	8.9	1.3
MDA	127	1	2	1.4	0.2	123	0	5	0	10.1	-1.5
MON	123	0	13	1.8	0.4	105	0	5	0	6.5	0.5
MPD	407	1	15	2.3	1.0	355	0	7	0	8.0	0.3
MPH	1061	0	6	1.8	-0.7	1006	0	5	0	7.8	0.3
NCA	635	0	4	1.6	0.3	627	0	6	0	9.2	0.5
NWA	4852	0	13	1.6	0.4	4659	0	12	0	7.7	0.5
OAL	29	3	31	3.2	1.7	23	0	17	0	11.3	-0.1
PAC	192	2	30	2.1	0.5	178	1	25	0	7.0	0.7
PAL	640	1	4	1.5	-0.2	622	0	6	0	10.1	0.6
PAO	320	1	46	1.4	0.2	316	0	47	0	8.4	1.5
PAQ	46	0	7	1.6	-0.1	45	0	16	0	13.1	-1.4
QFA	2008	1	35	1.7	-0.1	2004	0	35	0	8.0	0.7
RAF	159	0	3	1.8	0.9	159	0	72	0	8.7	2.5
RAM	80	0	4	2.2	0.2	79	0	3	0	8.7	0.5
RCH	543	3	28	2.5	0.9	507	0	26	0	9.3	1.0
RJA	41	2	32	3.6	0.3	32	0	19	0	10.1	-0.4
RKA	91	0	7	1.9	-0.5	62	0	8	0	8.4	1.7
ROY	270	1	16	2.1	-0.4	245	0	11	0	9.5	0.5
RRR	154	2	21	2.1	-0.1	134	1	19	0	8.8	0.5
RYN	280	0	45	1.0	0.3	279	0	45	0	6.1	1.3
SAA	275	1	4	1.7	0.2	253	0	6	0	10.4	1.4
SAB	109	0	17	2.3	0.2	98	0	9	0	8.0	0.5
SAS	1268	1	2	1.7	-0.3	1250	0	2	0	7.5	0.0
SIA	1613	0	7	1.7	-0.7	1588	0	8	0	8.0	0.2
SLR	133	2	14	1.5	-0.3	133	0	14	0	8.1	0.8
SOL	46	0	0	1.0	0.1	46	0	4	0	9.7	2.0
SSV	41	2	15	2.2	-0.6	34	3	9	0	5.7	1.1
SVA	119	0	8	1.8	-0.5	125	0	10	0	9.3	0.6
SVV	27	0	4	2.7	-0.7	25	0	36	0	19.6	6.6

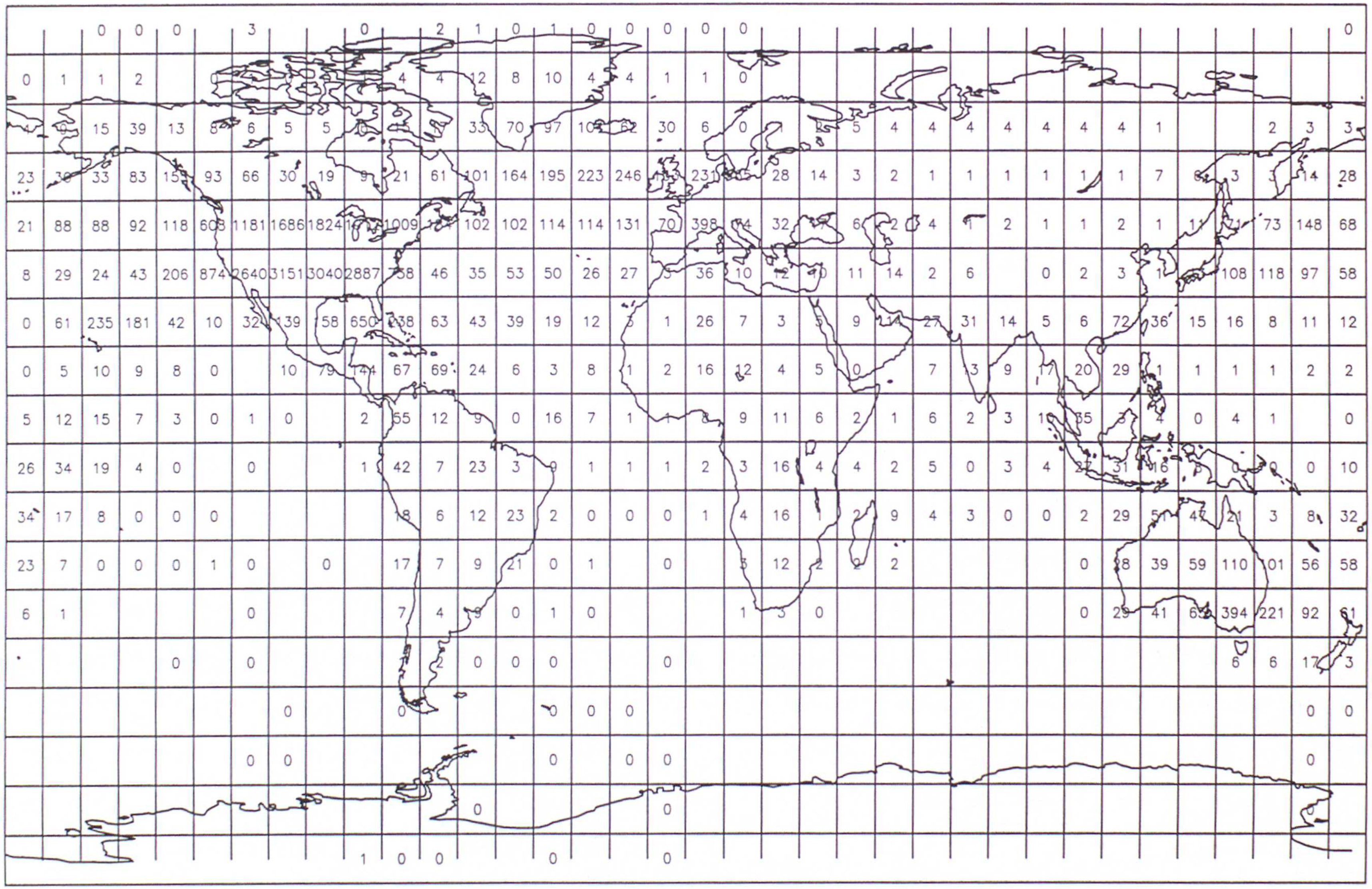
	TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SWR	160	1	31	2.2	0.3	127	0	20	0	8.3	0.3
TAM	22	9	27	0.9	0.2	23	0	30	0	15.3	3.1
TAP	715	1	6	1.5	-0.3	695	0	5	0	9.0	0.7
TBA	48	6	29	2.8	0.4	45	0	31	0	17.9	-2.8
THA	598	1	9	1.5	-0.4	593	0	9	0	7.5	0.0
TOW	182	1	27	2.2	-0.1	143	0	17	0	10.5	1.6
TSC	368	1	21	1.9	0.4	323	0	15	0	9.2	0.6
TWA	1561	1	38	2.2	0.6	1204	0	28	0	8.6	0.9
UAL	103935	1	89	1.1	-0.1	103495	0	89	0	5.3	0.4
UPS	1383	1	37	1.8	0.2	1275	0	33	0	7.5	0.7
USA	344	0	31	2.0	-0.2	258	0	18	0	7.7	1.2
VIR	323	0	18	2.2	-0.4	286	0	9	0	8.8	1.0
VKG	75	1	9	2.2	0.7	73	1	7	0	7.6	0.9
VRG	351	3	33	2.2	0.8	325	1	100	0	12.4	1.8
VSP	285	3	15	1.5	0.4	277	0	14	0	9.7	0.8
VVR	40	0	48	2.8	1.3	41	0	46	0	7.3	0.8
WOA	67	0	3	1.7	0.1	67	0	3	0	7.9	1.6
AN	22044	0	1	1.4	0.1	22044	0	1	0	6.6	0.9
BA	33385	1	7	1.8	0.5	33346	0	13	0	6.7	0.7
IT	527	0	46	1.1	0.2	527	0	47	0	7.8	1.1
KL	9937	0	11	1.5	0.8	9935	0	41	0	6.4	0.7
LH	2893	0	1	1.8	1.1	3009	0	1	0	6.7	0.4
MK	1952	0	1	1.9	1.5	1945	0	1	0	8.6	0.5
OZ	23	0	52	1.4	-0.3	23	0	52	0	7.5	2.4
QF	15758	0	1	1.3	0.4	15756	0	1	0	6.3	0.8
SA	1711	0	74	2.4	2.0	1710	0	1	0	7.1	0.9
SK	540	0	23	1.2	-0.2	540	0	23	0	4.4	0.2
SV	2119	0	73	2.1	1.9	2104	0	73	0	5.8	0.5
UA	4431	1	35	1.4	0.0	4545	0	34	0	7.3	0.8
WA	847	10	12	1.7	0.5	826	5	77	0	9.8	-1.2
XX	2355	1	4	1.5	0.5	3221	0	100	0	12.6	2.1
N	679	1	20	2.6	0.8	610	0	17	0	9.5	1.3
ADS	1267	0	1	1.3	0.1	1267	0	100	0	6.3	0.7
US ACAR	501716	0	8	1.1	0.2	501667	0	9	0	5.7	0.6

MEAN DAILY COUNT OF AIRCRAFT 70 – 500 HPA

SEPTEMBER 1998

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

FIGURE 3

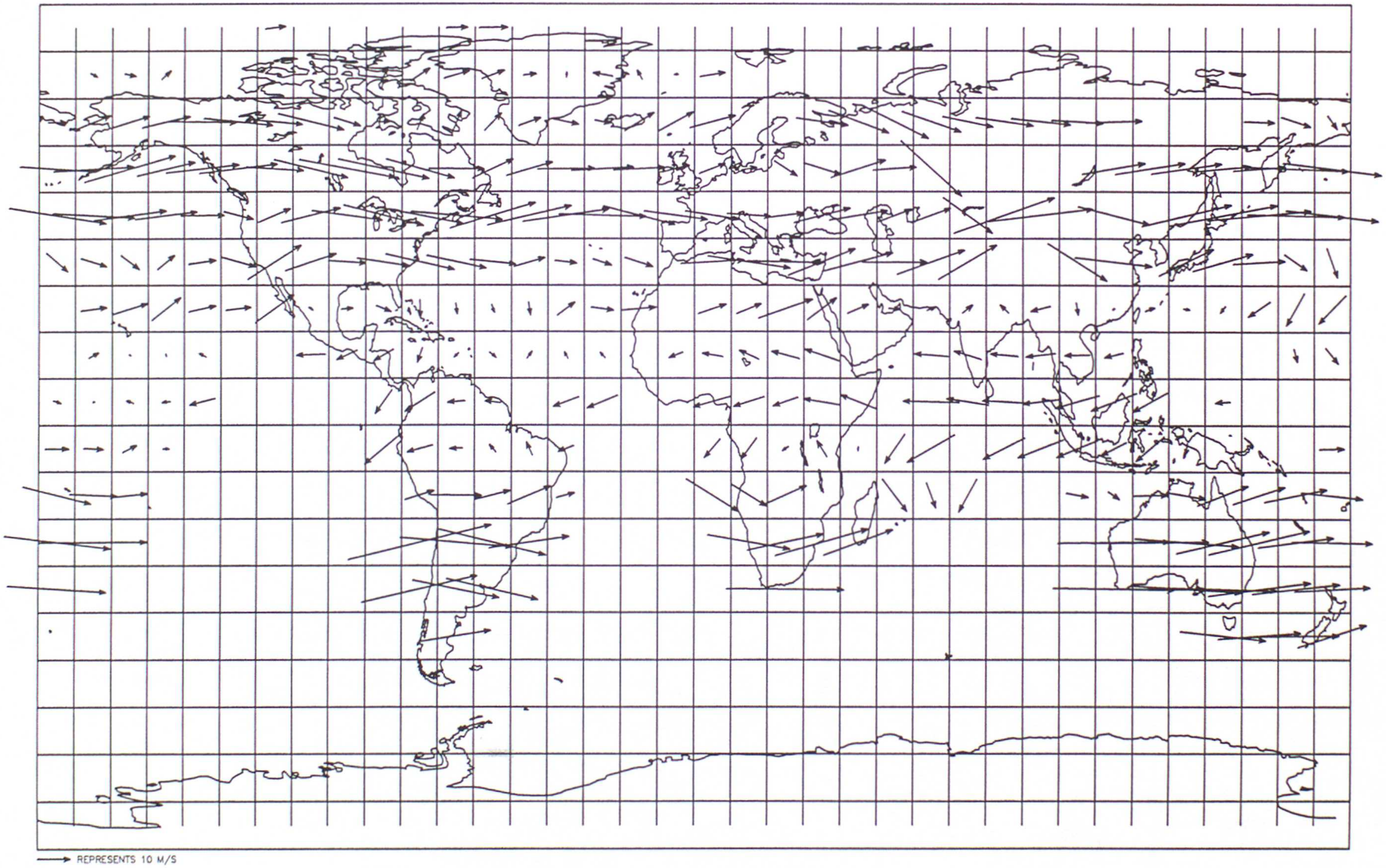


AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA FIGURE 4

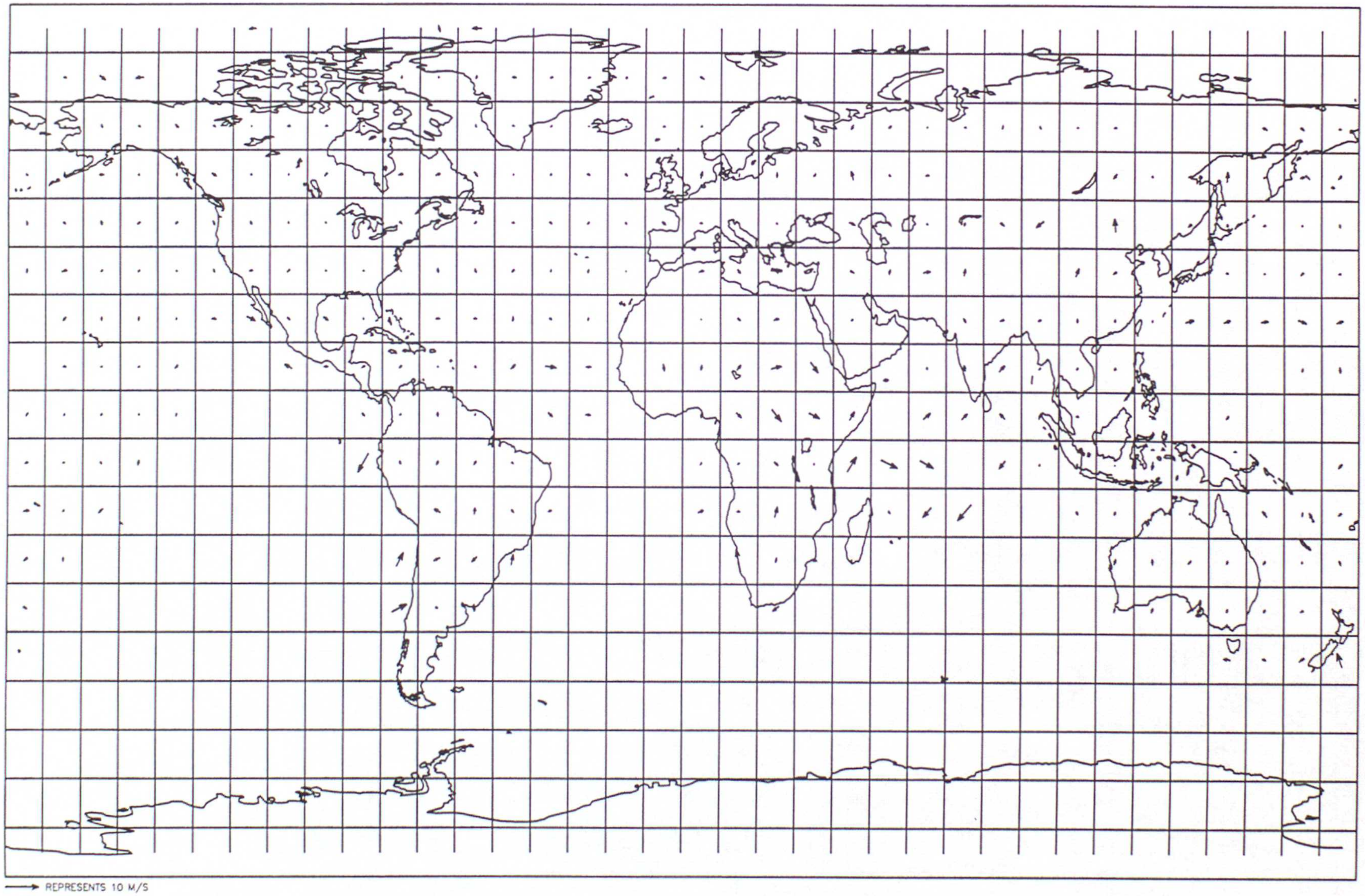
SEPTEMBER 1998

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

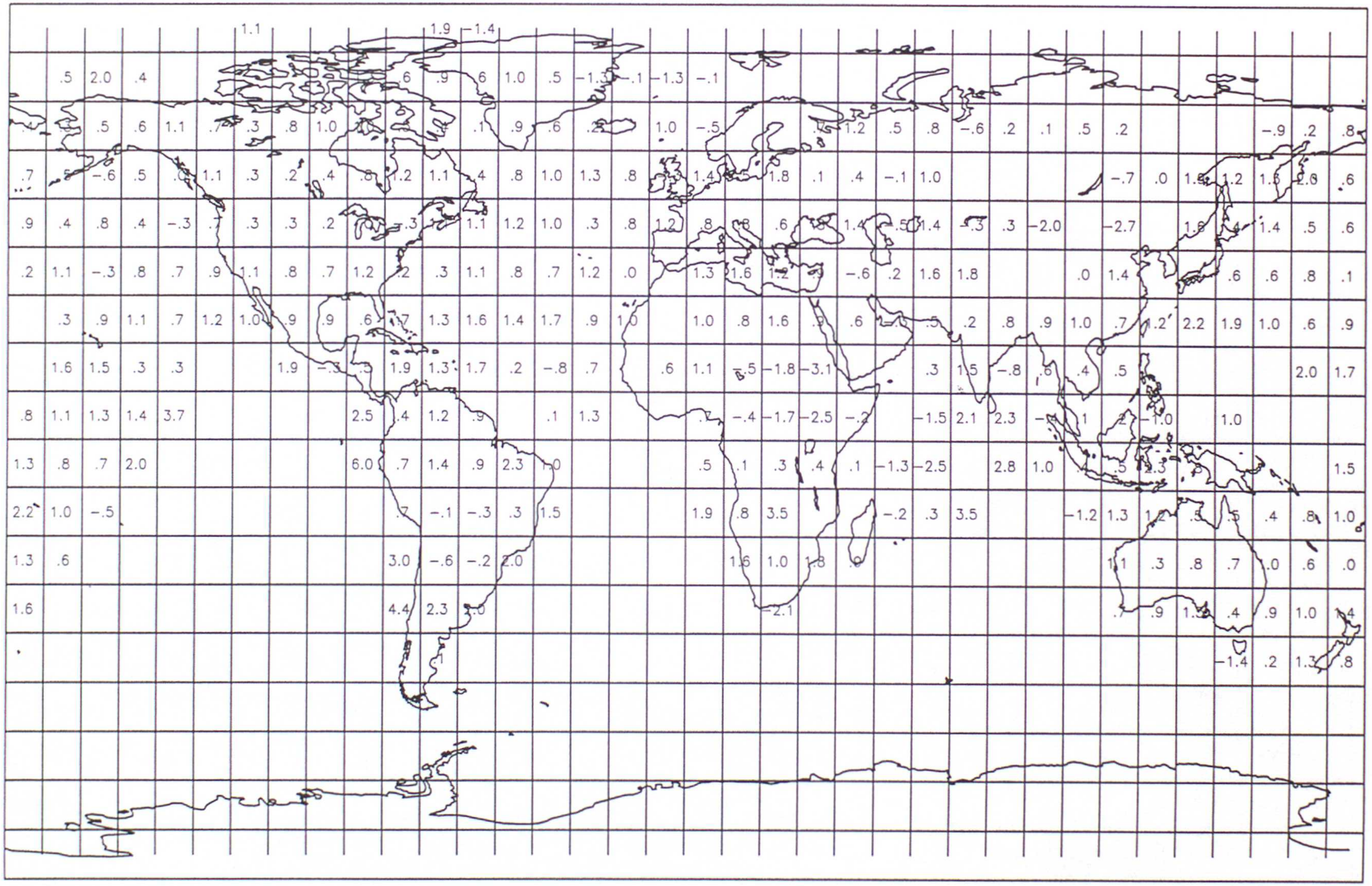
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT MEAN O–B WINDS BETWEEN 70 AND 500 HPA FIGURE 5
SEPTEMBER 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O−B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
SEPTEMBER 1998
OBSERVATIONS WITH O−B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


1.1 1.9 −1.4
.5 2.0 .4 .6 .9 .6 1.0 .5 −1.3 −.1 −1.3 −.1
.5 .6 1.1 .7 .3 .8 1.0 .1 .9 .6 .2 1.0 −.5 1.2 .5 .8 −.6 .2 .1 .5 .2 −.9 .2 .8
.7 −.6 .5 1.1 .3 .2 .4 .8 1.2 1.1 .4 .8 1.0 1.3 .8 1.4 1.8 .1 .4 −.1 1.0 −.7 .0 1.2 .6
.9 .4 .8 .4 −.3 .3 .3 .2 −.3 1.1 1.2 1.0 .3 .8 1.2 .8 .6 1.4 1.4 −.3 .3 −2.0 −2.7 .4 1.4 .5 .6
.2 1.1 −.3 .8 .7 .9 1.1 .8 .7 1.2 .2 .3 1.1 .8 .7 1.2 .0 1.3 1.6 1.2 −.6 .2 1.6 1.8 .0 1.4 .6 .6 .8 .1
.3 .9 1.1 .7 1.2 1.0 .9 .9 .6 .7 1.3 1.6 1.4 1.7 .9 1.0 1.0 .8 1.6 .6 .5 .2 .8 .9 1.0 .7 1.2 2.2 1.9 1.0 .6 .9
1.6 1.5 .3 .3 1.9 −.3 1.9 1.3 1.7 .2 −.8 .7 .6 1.1 .5 −1.8 −3.1 .3 1.5 −.8 .6 .4 .5 2.0 1.7
.8 1.1 1.3 1.4 3.7 2.5 .4 1.2 .9 .1 1.3 −.4 −1.7 −2.5 −.2 −1.5 2.1 2.3 .2 −1.0 1.0
1.3 .8 .7 2.0 6.0 .7 1.4 .9 2.3 1.0 .5 .1 .3 .4 .1 −1.3 −2.5 2.8 1.0 .5 2.3 1.5
2.2 1.0 −.5 .7 −.1 −.3 .3 1.5 1.9 .8 3.5 −.2 .3 3.5 −1.2 1.3 1.2 .5 .5 .4 .8 1.0
1.3 .6 3.0 −.6 −.2 2.0 1.6 1.0 1.8 1.1 .3 .8 .7 1.0 .6 .0
1.6 4.4 2.3 −2.1 .7 .9 1.3 .4 .9 1.0 1.4
−1.4 .2 1.3 .8

AIRCRAFT : RMS O–B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
SEPTEMBER 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

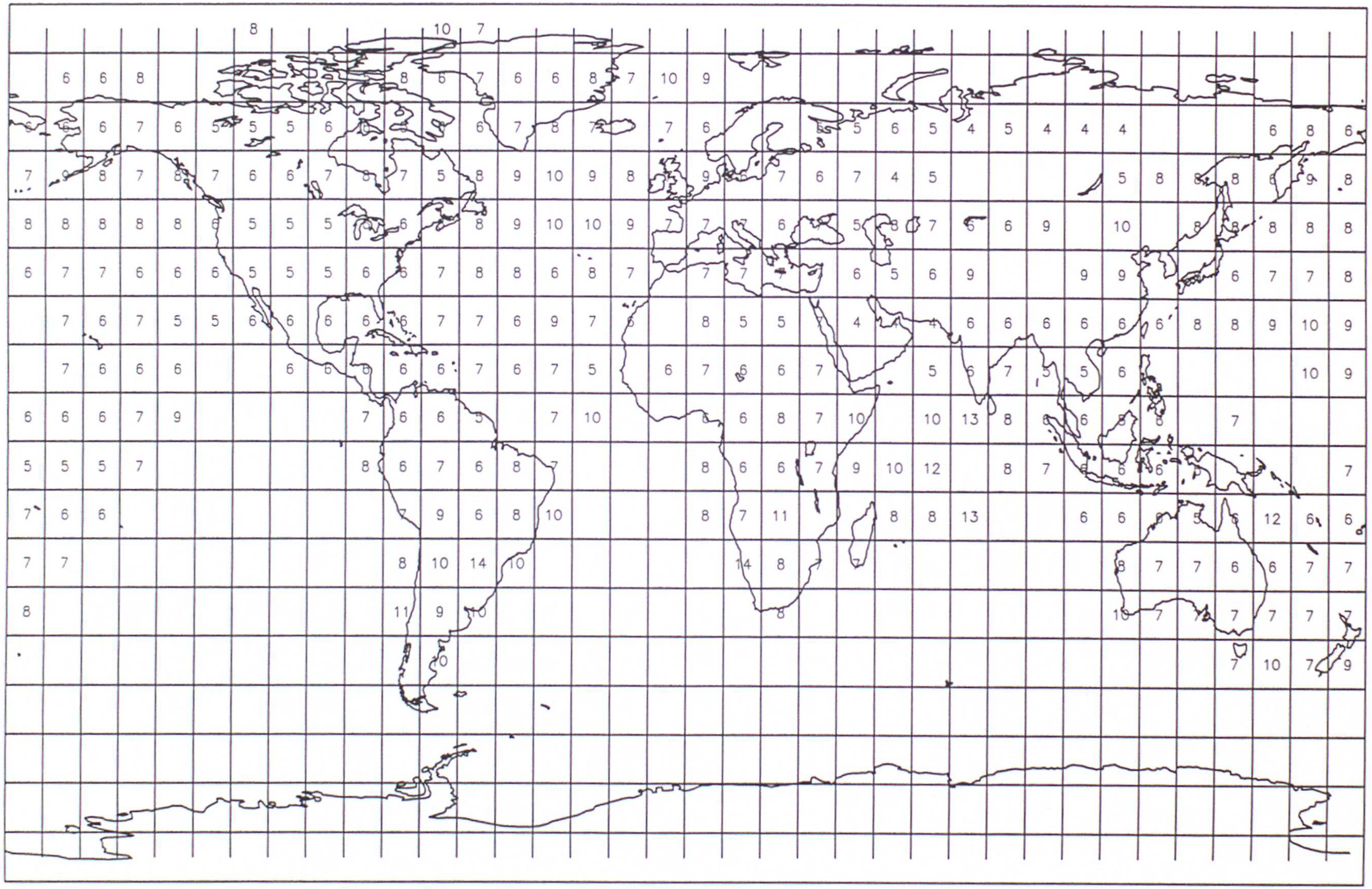

8 10 7
6 6 8 8 6 7 6 6 8 7 10 9
6 6 6 7 6 5 5 5 6 6 7 8 7 7 6 5 6 5 4 5 4 4 4 6 8 6
7 9 8 7 8 7 6 6 7 8 7 5 8 9 10 9 8 9 6 7 6 7 4 5 5 8 8 8 6 9 8
8 8 8 8 8 6 5 5 5 6 8 9 10 10 9 7 7 7 6 5 8 7 6 6 9 10 8 8 8 8 8
6 7 7 6 6 6 5 5 5 6 6 7 8 8 6 8 7 7 7 6 5 6 9 9 9 6 7 7 8
7 6 7 5 5 6 6 6 6 6 7 7 6 9 7 6 8 5 5 7 4 4 6 6 6 6 6 6 8 8 9 10 9
7 6 6 6 6 6 6 6 6 7 6 7 5 6 7 6 6 7 5 6 7 5 5 6 10 9
6 6 6 7 9 7 6 6 5 7 10 6 6 8 7 10 10 13 8 6 6 8 8 7
5 5 5 7 8 6 7 6 8 7 8 6 6 7 9 10 12 8 7 6 6 6 7
7 6 6 7 9 6 8 10 8 7 11 8 8 13 6 6 6 5 5 12 6 6
7 7 8 10 14 10 14 8 7 7 8 7 7 6 6 7 7
8 11 9 10 8 10 7 7 7 7 7 7
10 7 10 7 9

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
26477	12	Z	200	56/ 31	17	1	71.5	70.8	100.6	5
31168	00	Z	250	56/ 138	15	1	45.2	67.4	81.1	4
42027	00	Z	200	34/ 75	13	3	73.7	-137.2	155.7	9
42027	12	Z	100	34/ 75	11	0	116.7	-138.5	181.1	5
42101	12	Z	100	30/ 76	19	0	101.8	116.2	154.5	5
42314	00	Z	100	27/ 95	16	1	75.5	92.9	119.7	4
42314	12	Z	100	27/ 95	16	0	91.8	-92.1	130.0	4
42361	12	Z	150	26/ 78	10	0	77.1	93.2	120.9	4
42379	00	Z	500	27/ 83	23	0	43.7	40.0	59.3	7
42647	12	Z	250	23/ 73	17	0	66.9	54.2	86.1	6
42701	12	Z	100	23/ 85	15	0	123.6	43.0	130.9	4
42724	00	Z	400	24/ 91	26	0	42.6	43.3	60.8	5
42724	12	Z	400	24/ 91	22	0	43.4	38.1	57.8	6
43003	12	Z	200	19/ 73	21	4	57.9	115.5	129.2	6
43014	00	Z	200	20/ 75	10	1	81.3	-122.4	147.0	4
43353	00	Z	100	10/ 76	15	1	99.4	-106.6	145.8	4
43369	00	Z	100	8/ 73	19	2	65.0	-135.2	150.0	6
43371	12	Z	150	8/ 77	25	2	69.3	129.8	147.2	6
52889	12	Z	1000	36/ 104	27	0	19.6	56.7	60.0	4
53463	00	Z	1000	41/ 112	28	0	11.6	48.5	49.8	7
53463	12	Z	1000	41/ 112	28	0	17.0	25.0	30.2	4
53772	00	Z	1000	38/ 113	28	0	10.7	37.1	38.6	5
54135	00	Z	100	44/ 122	29	0	38.2	103.8	110.6	4
57972	00	Z	100	26/ 113	27	0	45.6	130.8	138.5	4
84628	12	Z	850	-12/ -77	22	0	7.6	-76.4	76.7	8
89512	00	Z	1000	-71/ 12	17	7	14.5	82.6	83.9	10
89664	00	Z	200	-78/ 167	10	2	48.7	126.4	135.5	6
97724	00	Z	300	-4/ 128	21	2	42.7	-58.2	72.2	5

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – SEPTEMBER 1998 FIGURE 8
ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1098

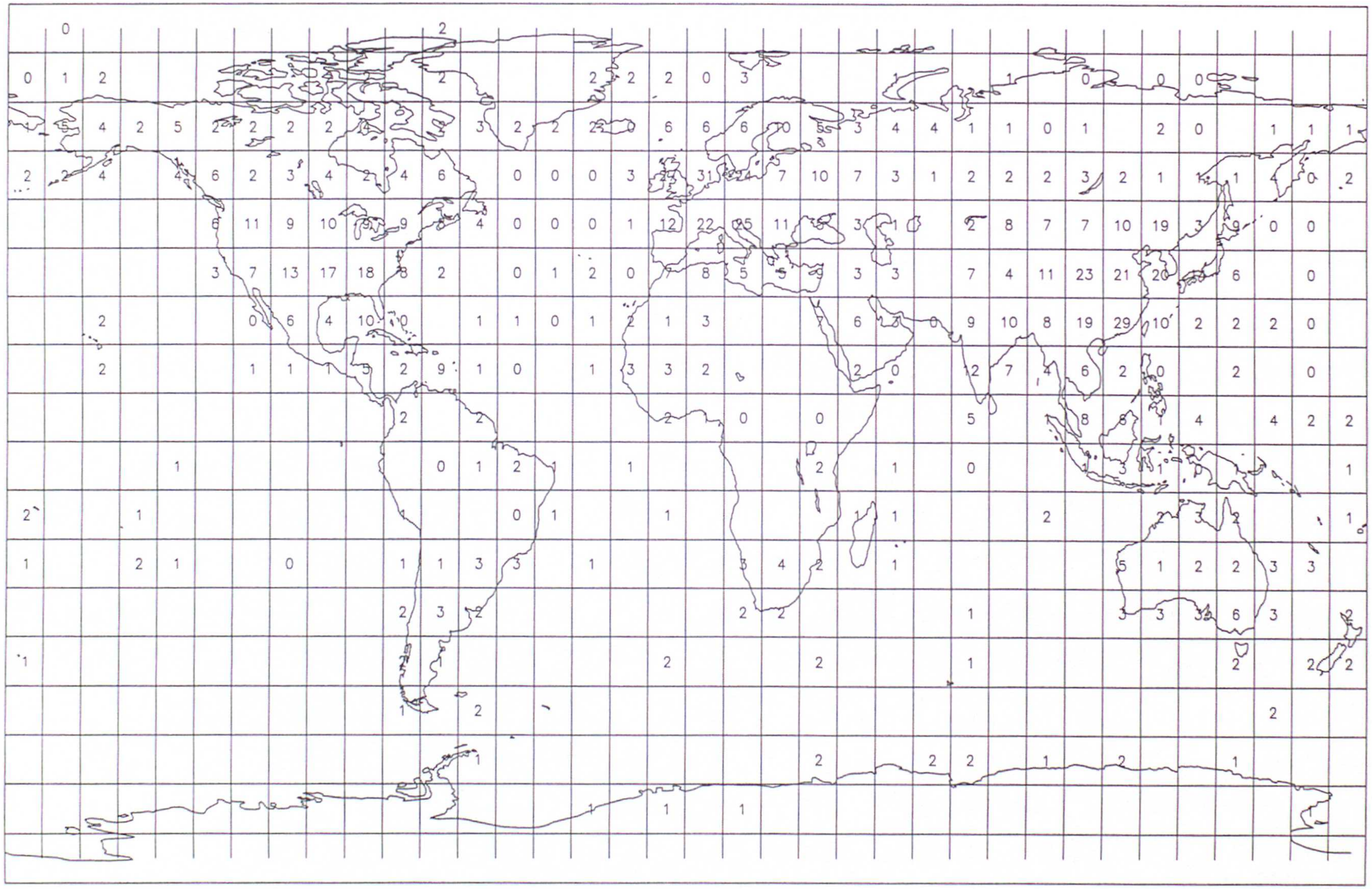

0 2
0 1 2 2 2 2 2 0 3 1 1 0 0 0
1 5 4 2 5 2 2 2 2 4 3 2 2 2 0 6 6 6 0 5 3 4 4 1 1 0 1 2 0 1 1 1
2 2 4 4 6 2 3 4 2 4 6 0 0 0 3 2 31 4 7 10 7 3 1 2 2 2 3 2 1 1 1 4 0 2
6 11 9 10 9 9 8 4 0 0 0 1 12 22 25 11 8 3 1 2 8 7 7 10 19 3 9 0 0
3 7 13 17 18 8 2 0 1 2 0 7 8 5 5 9 3 3 7 4 11 23 21 20 6 0
2 0 6 4 10 0 1 1 0 1 2 1 3 7 6 3 0 9 10 8 19 29 10 2 2 2 0
2 1 1 1 5 2 9 1 0 1 3 3 2 2 0 12 7 4 6 2 0 2 0
2 2 2 0 0 5 1 8 8 1 4 4 2 2
1 0 1 2 1 1 2 1 0 3 1 1
2 1 1 0 1 1 1 1 2 2 3 2 1 1
1 2 1 0 1 1 3 3 1 3 4 2 1 5 1 2 2 3 3
2 3 2 2 2 1 3 3 3 6 3 2
1 1 2 2 1 2 2 2
1 2 2
1 2 2 2 1 2 1
1 1 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored		
	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: $\geq$ 10 observations and $\geq$ 15 m s^{-1} RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
43369	12	V	100	8/ 73	20	0	10	-6.1	3.6	15.3	1
76679	12	V	150	19/ -99	18	0	16	-11.3	8.3	17.0	2

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – SEPTEMBER 1998

FIGURE 9

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1209

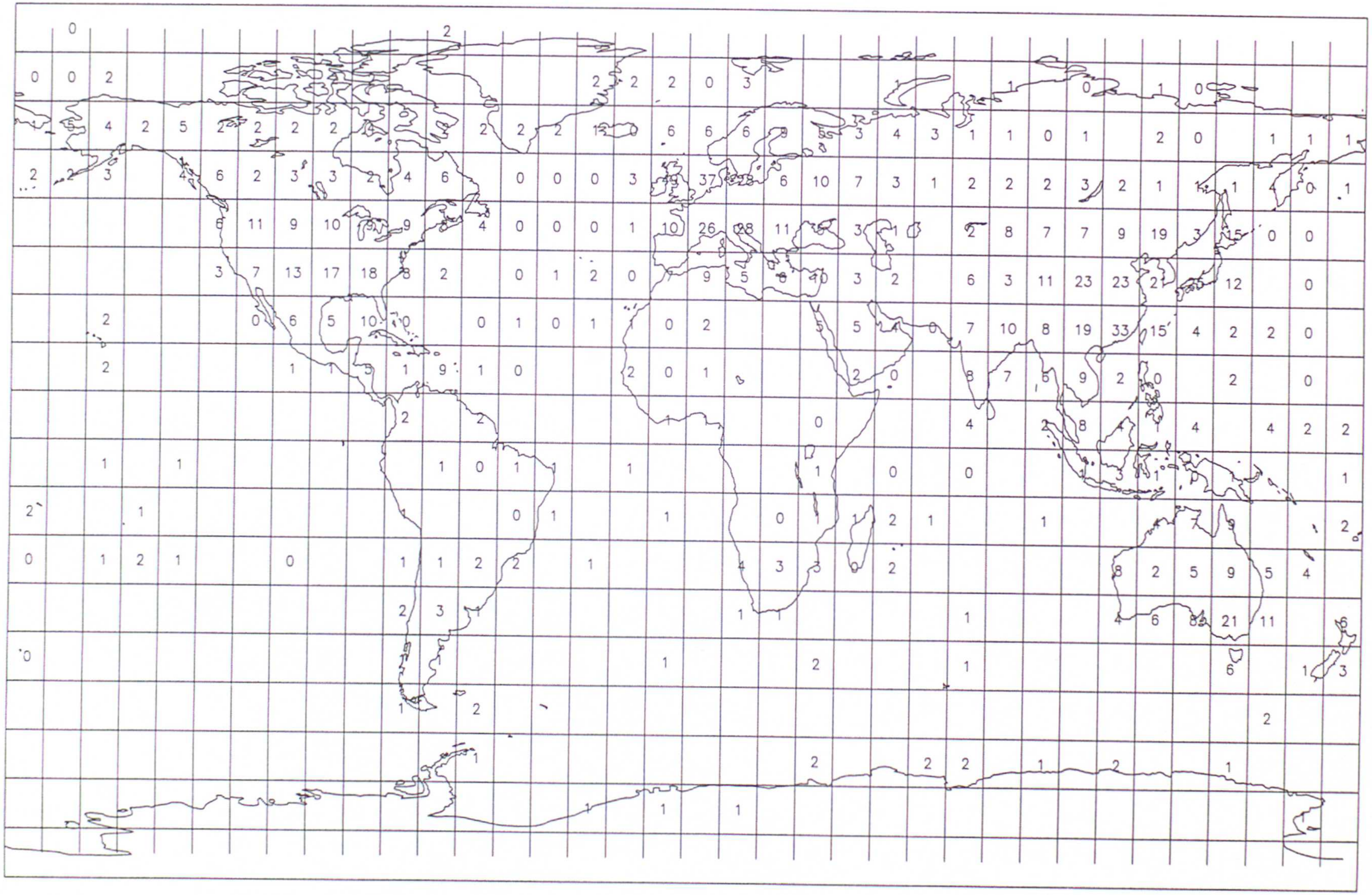

0 2
0 0 2 2 2 2 0 3 1 0 1 0
5 4 2 5 2 2 2 2 4 2 2 2 13 6 6 6 9 55 3 4 3 1 1 0 1 2 0 1 1 1
2 2 3 4 6 2 3 3 2 4 6 0 0 0 3 49 37 6 10 7 3 1 2 2 2 3 2 1 1 1 0 1
6 11 9 10 9 9 4 0 0 0 1 10 26 28 11 3 1 2 8 7 7 9 19 3 15 0 0
3 7 13 17 18 8 2 0 1 2 0 7 9 5 8 40 3 2 6 3 11 23 23 21 12 0
2 0 6 5 10 0 0 1 0 1 1 0 2 5 5 0 7 10 8 19 33 15 4 2 2 0
2 1 1 5 1 9 1 0 2 0 1 2 0 8 7 6 9 2 0 2 0
2 2 1 0 4 2 8 4 4 4 2 2
1 1 1 0 1 1 1 1 0 0 1 3 1 1
2 1 1 0 1 1 0 1 2 1 1 7 9 2
0 1 2 1 0 1 1 2 2 1 4 3 3 0 2 8 2 5 9 5 4
2 3 1 1 1 1 4 6 83 21 11 6
0 1 2 1 6 1 3
1 2 2
1 2 2 2 1 2 1
1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from Bracknell global model.
Observation times	:00 UTC and 12 UTC.
Level(s) monitored	:Standard levels between 500.0 - 150.0 hPa
Element monitored	:WIND DIRECTION in degrees

Parameters monitored

:NUM OBS	:Average number of observations at all levels.
:BIAS	:Mean difference of observations from background values from all levels.
:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA

:NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
17280	00	DD	38/ 40	26	-10.1	8.0	13.9
42314	12	DD	27/ 95	7	-14.1	8.6	17.9
43369	00	DD	8/ 73	18	17.4	6.6	18.1
44288	12	DD	46/ 103	12	-12.1	6.8	14.1
56294	00	DD	31/ 104	21	-10.4	6.7	15.6
57516	00	DD	30/ 106	21	-11.1	7.5	21.3
59134	12	DD	24/ 118	22	10.3	4.1	23.0
60490	12	DD	36/ -1	22	13.2	6.5	19.5
62337	00	DD	31/ 34	23	-19.2	7.7	11.7
62337	12	DD	31/ 34	23	-20.6	3.1	9.4
63450	12	DD	9/ 39	9	-11.1	9.9	19.1
71945	12	DD	59/-123	25	11.1	4.3	14.5
78384	12	DD	19/ -81	16	-10.1	7.3	27.2
78866	00	DD	18/ -63	9	-10.1	9.3	18.5
91366	12	DD	9/ 168	12	10.2	10.0	27.5

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: September 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES, METEOSAT, GMS, INSAT.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

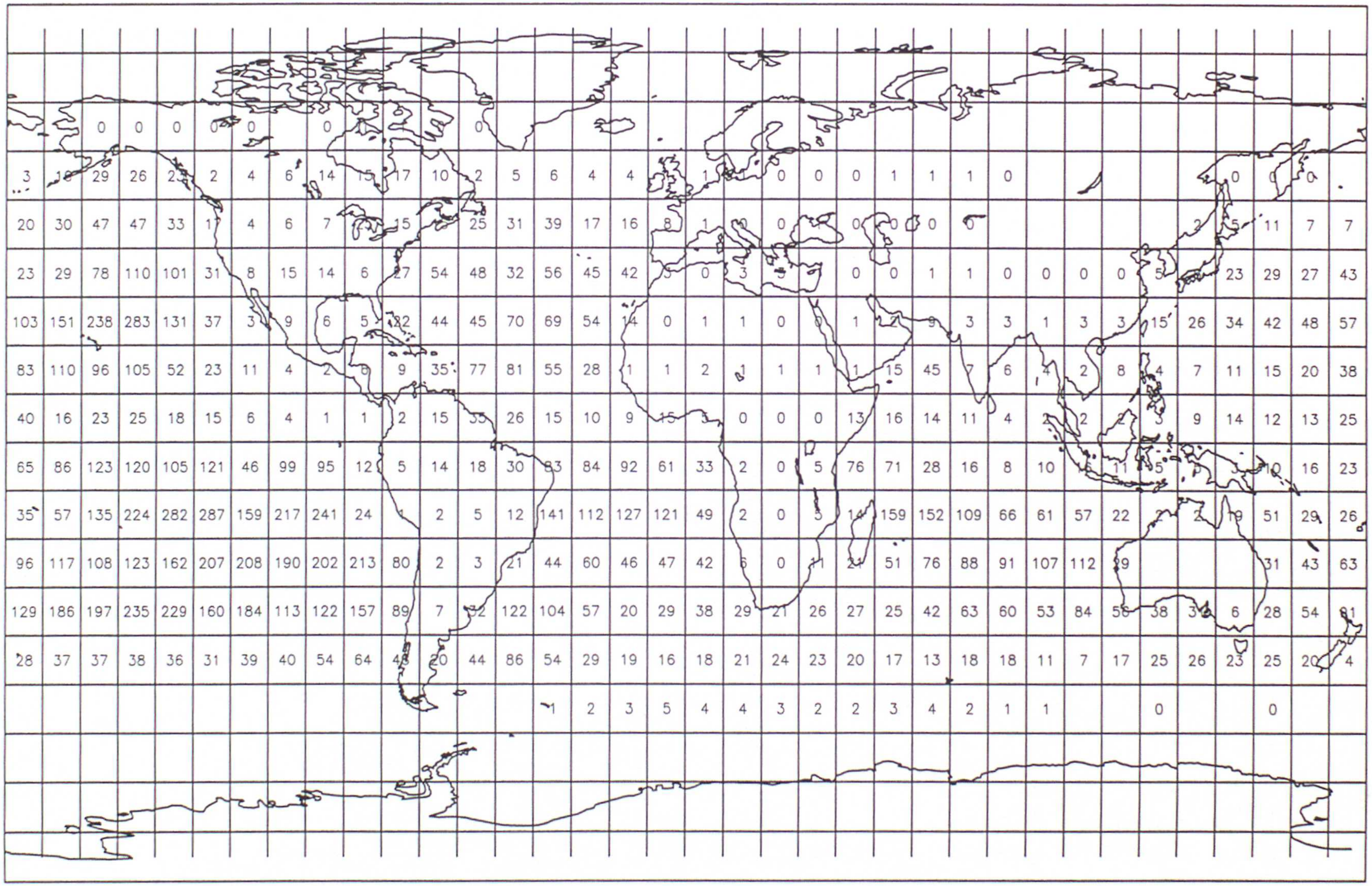
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
SEPTEMBER 1998


0 0 0 0 0 0 0
3 18 29 26 23 2 4 6 14 15 17 10 2 5 6 4 4 1 1 0 0 0 1 1 1 0 0 0 0
20 30 47 47 33 17 4 6 7 15 25 31 39 17 16 8 1 0 0 0 0 0 0 2 5 11 7 7
23 29 78 110 101 31 8 15 14 6 27 54 48 32 56 45 42 3 0 3 3 0 0 1 1 0 0 0 0 5 23 29 27 43
103 151 238 283 131 37 3 9 6 5 22 44 45 70 69 54 14 0 1 1 0 0 1 2 9 3 3 1 3 3 15 26 34 42 48 57
83 110 96 105 52 23 11 4 2 6 9 35 77 81 55 28 1 1 2 1 1 1 1 15 45 7 6 4 2 8 4 7 11 15 20 38
40 16 23 25 18 15 6 4 1 1 2 15 35 26 15 10 9 15 5 0 0 0 13 16 14 11 4 2 2 2 3 9 14 12 13 25
65 86 123 120 105 121 46 99 95 12 5 14 18 30 83 84 92 61 33 2 0 5 76 71 28 16 8 10 16 11 5 5 3 10 16 23
35 57 135 224 282 287 159 217 241 24 1 2 5 12 141 112 127 121 49 2 0 5 14 159 152 109 66 61 57 22 2 2 19 51 29 26
96 117 108 123 162 207 208 190 202 213 80 2 3 21 44 60 46 47 42 6 0 11 21 51 76 88 91 107 112 29 31 43 63
129 186 197 235 229 160 184 113 122 157 89 7 32 122 104 57 20 29 38 29 21 26 27 25 42 63 60 53 84 56 38 36 6 28 54 81
28 37 37 38 36 31 39 40 54 64 48 20 44 86 54 29 19 16 18 21 24 23 20 17 13 18 18 11 7 17 25 26 23 25 20 4
1 2 3 5 4 4 3 2 2 3 4 2 1 1 0 0

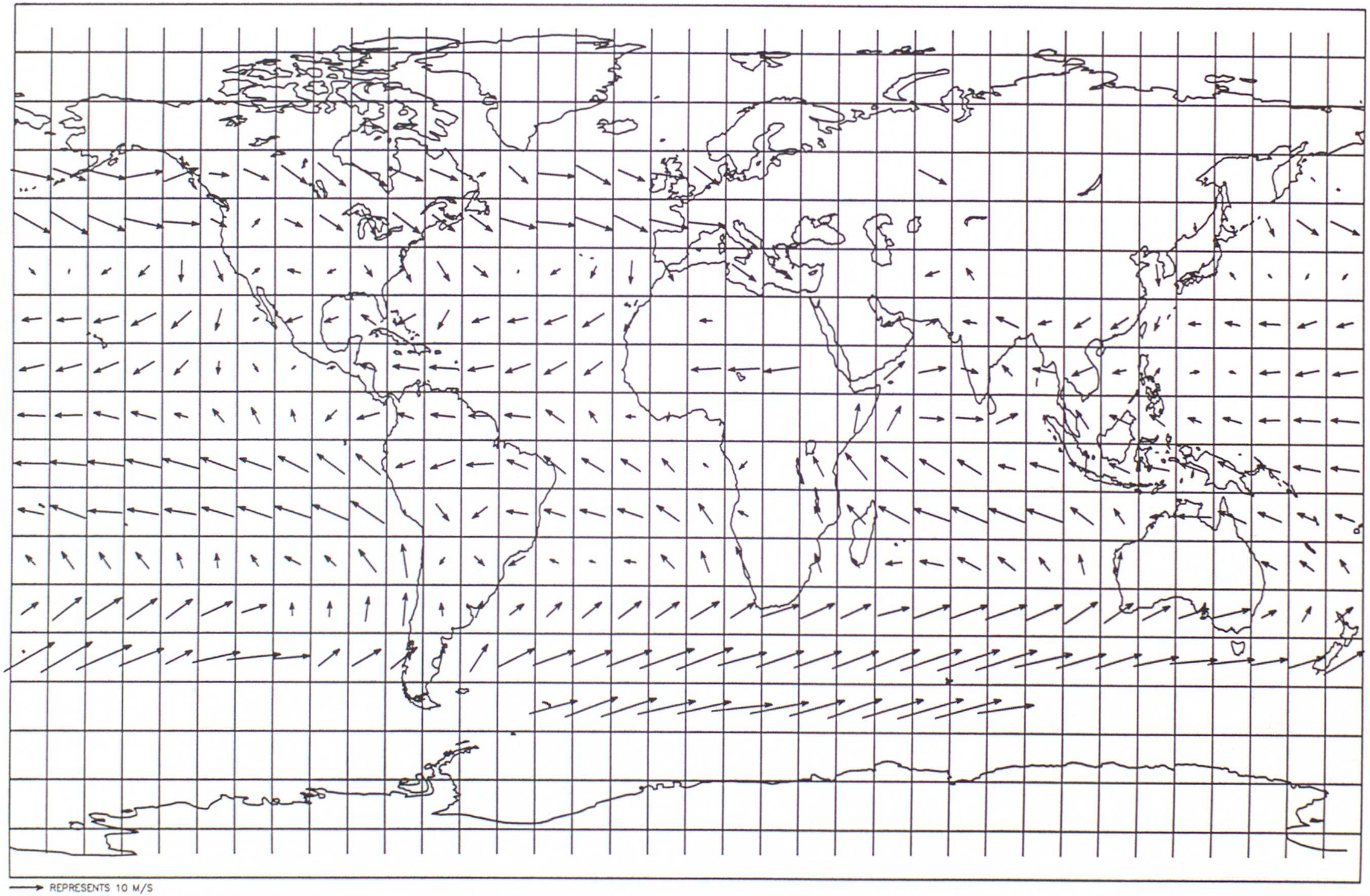
SATOB VECTOR MEAN WINDS BETWEEN 701–1000 HPA

SEPTEMBER 1998

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11


REPRESENTS 10 M/S

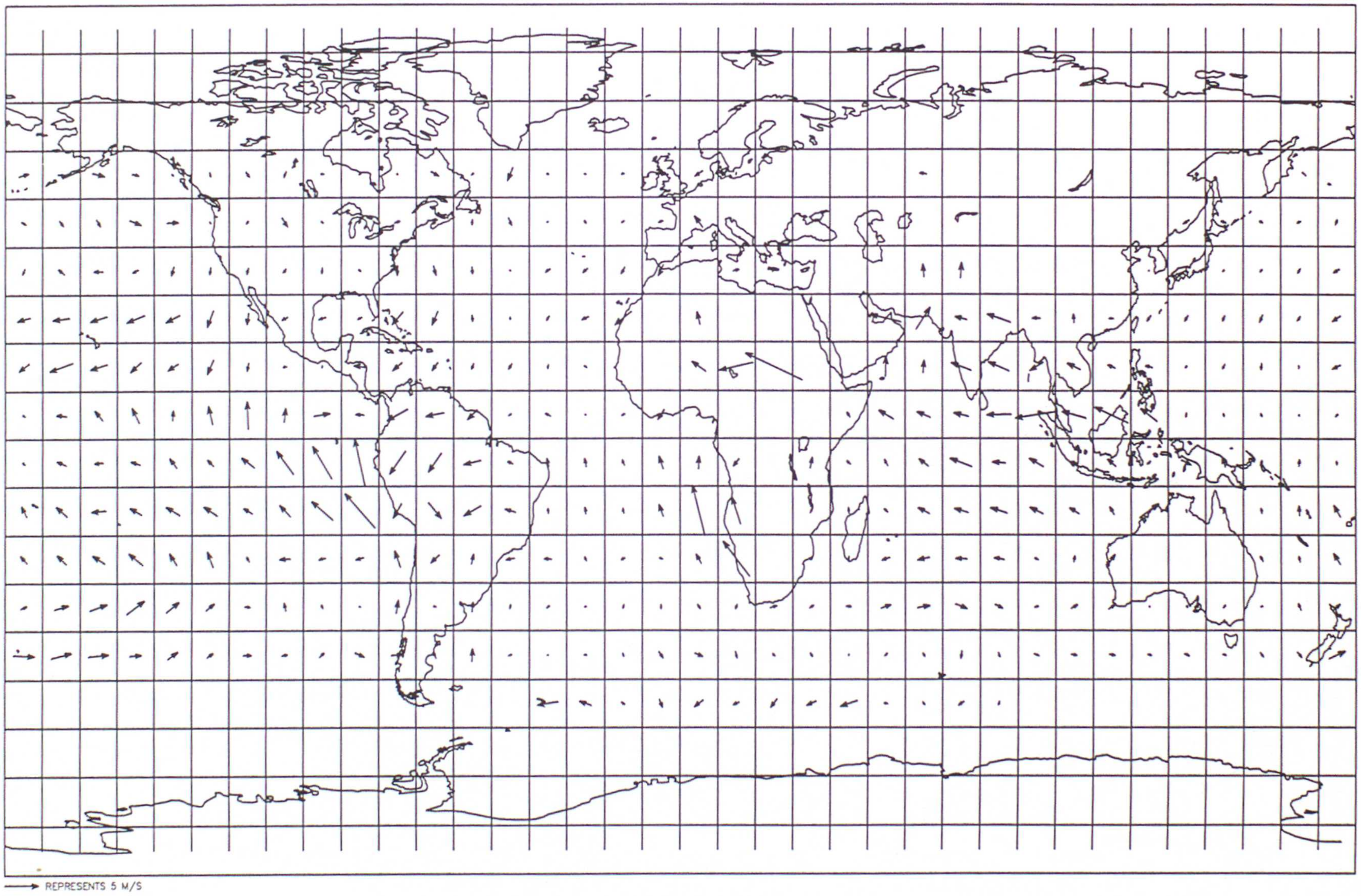
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA

SEPTEMBER 1998

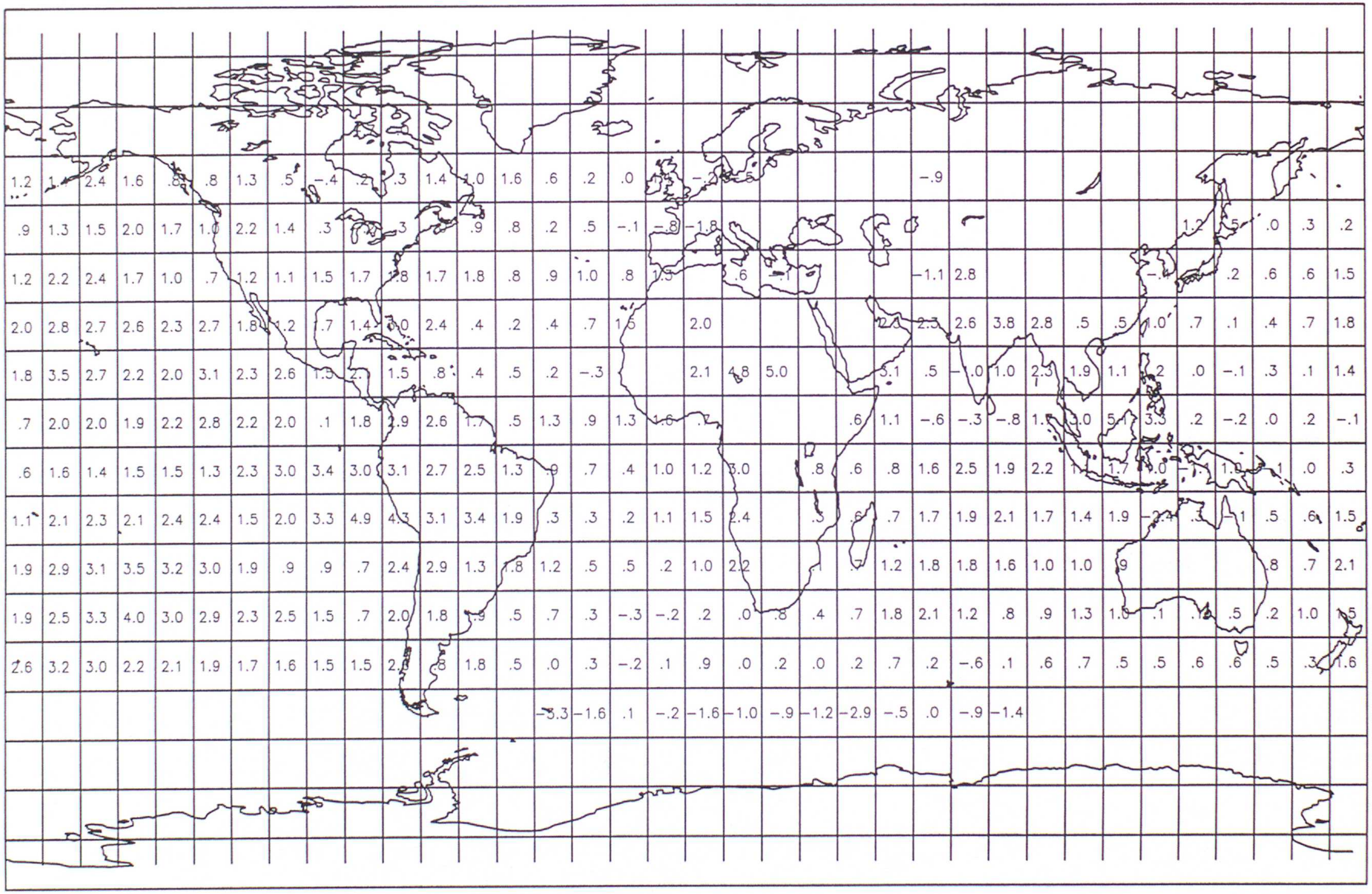
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

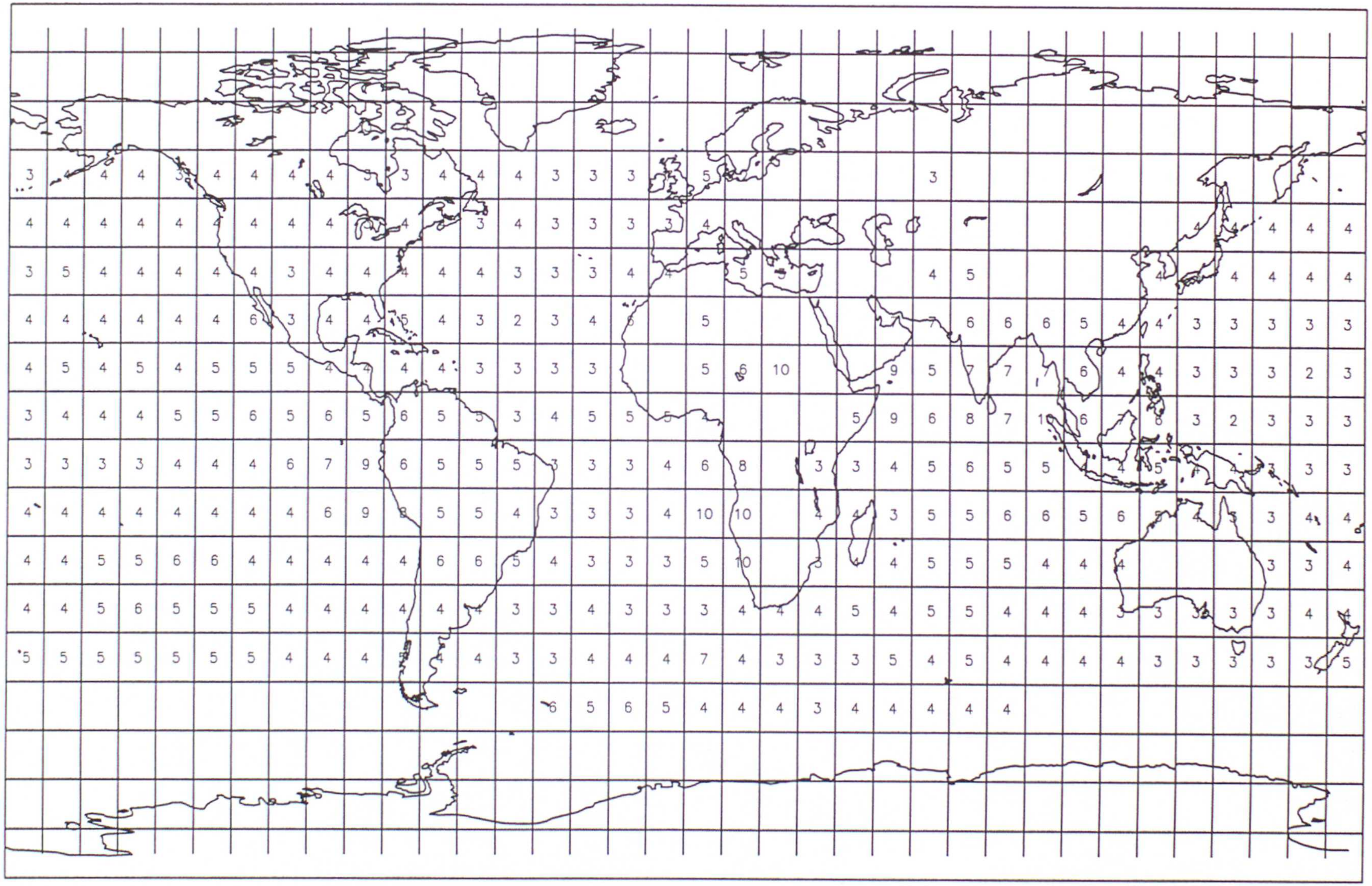
FIGURE 12



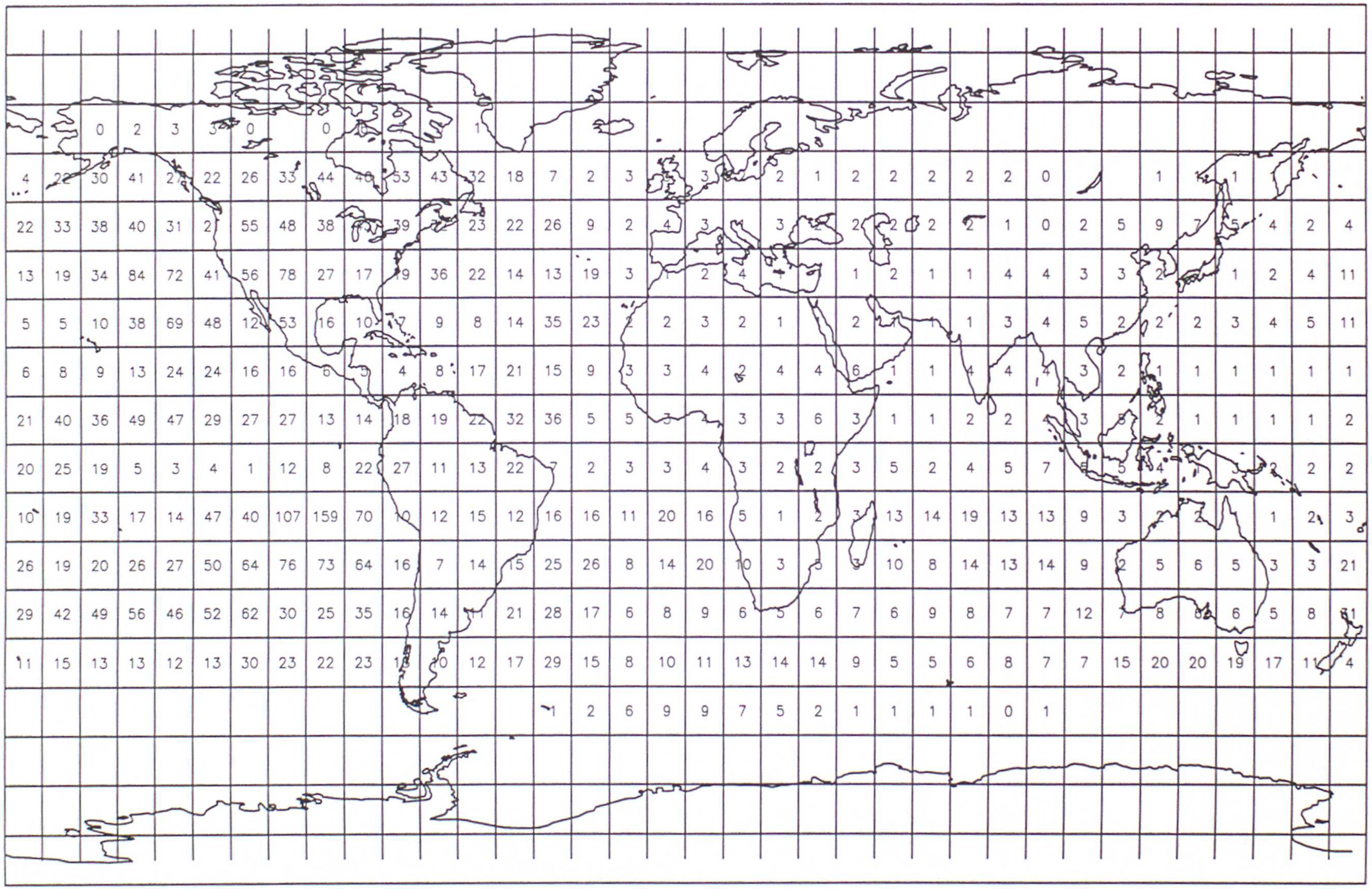
SATOBS : MEAN O−B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
SEPTEMBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


1.2 1.4 2.4 1.6 .8 .8 1.3 .5 −.4 .2 .3 1.4 1.0 1.6 .6 .2 .0 −.2 .5 −.9
.9 1.3 1.5 2.0 1.7 1.0 2.2 1.4 .3 .3 .9 .8 .2 .5 −.1 −.8 −1.8 1.2 .5 .0 .3 .2
1.2 2.2 2.4 1.7 1.0 .7 1.2 1.1 1.5 1.7 1.8 1.7 1.8 .8 .9 1.0 .8 1.5 .6 −.1 −1.1 2.8 −.4 .2 .6 .6 1.5
2.0 2.8 2.7 2.6 2.3 2.7 1.8 1.2 1.7 1.4 .0 2.4 .4 .2 .4 .7 1.5 2.0 2.3 2.3 2.6 3.8 2.8 .5 .5 1.0 .7 .1 .4 .7 1.8
1.8 3.5 2.7 2.2 2.0 3.1 2.3 2.6 1.5 2.1 1.5 .8 .4 .5 .2 −.3 2.1 4.8 5.0 3.1 .5 −1.0 1.0 2.3 1.9 1.1 .2 .0 −.1 .3 .1 1.4
.7 2.0 2.0 1.9 2.2 2.8 2.2 2.0 .1 1.8 2.9 2.6 1.7 .5 1.3 .9 1.3 1.6 .7 .6 1.1 −.6 −.3 −.8 1.7 3.0 5.1 3.3 .2 −.2 .0 .2 −.1
.6 1.6 1.4 1.5 1.5 1.3 2.3 3.0 3.4 3.0 3.1 2.7 2.5 1.3 .9 .7 .4 1.0 1.2 3.0 .8 .6 .8 1.6 2.5 1.9 2.2 1.1 1.7 1.0 −1.1 1.0 .1 .0 .3
1.1 2.1 2.3 2.1 2.4 2.4 1.5 2.0 3.3 4.9 4.3 3.1 3.4 1.9 .3 .3 .2 1.1 1.5 2.4 .3 .6 .7 1.7 1.9 2.1 1.7 1.4 1.9 −2.4 .3 −.1 .5 .6 1.5
1.9 2.9 3.1 3.5 3.2 3.0 1.9 .9 .9 .7 2.4 2.9 1.3 1.8 1.2 .5 .5 .2 1.0 2.2 .1 .7 1.2 1.8 1.8 1.6 1.0 1.0 .9 .8 .7 2.1
1.9 2.5 3.3 4.0 3.0 2.9 2.3 2.5 1.5 .7 2.0 1.8 1.9 .5 .7 .3 −.3 −.2 .2 .0 .8 .4 .7 1.8 2.1 1.2 .8 .9 1.3 1.0 .1 .1 .5 .2 1.0 1.5
2.6 3.2 3.0 2.2 2.1 1.9 1.7 1.6 1.5 1.5 2.3 .8 1.8 .5 .0 .3 −.2 .1 .9 .0 .2 .0 .2 .7 .2 −.6 .1 .6 .7 .5 .5 .6 .6 .5 .3 1.6
−3.3 −1.6 .1 −.2 −1.6 −1.0 −.9 −1.2 −2.9 −.5 .0 −.9 −1.4

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
SEPTEMBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


3 4 4 3 4 4 4 4 3 3 4 4 4 3 3 3 5 3
4 4 4 4 4 4 4 4 4 4 4 3 4 3 3 3 3 4 4 4 4 4 4
3 5 4 4 4 4 4 3 4 4 4 4 4 3 3 3 4 4 5 5 4 5 4 4 4 4 4
4 4 4 4 4 4 6 3 4 4 5 4 3 2 3 4 6 5 7 6 6 6 5 4 4 3 3 3 3 3
4 5 4 5 4 5 5 5 4 4 4 4 3 3 3 3 5 6 10 9 5 7 7 6 4 4 3 3 3 2 3
3 4 4 4 5 5 6 5 6 5 6 5 5 3 4 5 5 5 4 5 9 6 8 7 10 6 7 6 3 2 3 3 3
3 3 3 3 4 4 4 6 7 9 6 5 5 5 3 3 3 4 6 8 3 3 4 5 6 5 5 4 4 5 4 3 3 3
4 4 4 4 4 4 4 4 6 9 8 5 5 4 3 3 3 4 10 10 4 4 3 5 5 6 6 5 6 5 4 3 3 4 4
4 4 5 5 6 6 4 4 4 4 4 6 6 5 4 3 3 3 5 10 3 4 4 5 5 5 4 4 4 3 3 4
4 4 5 6 5 5 5 4 4 4 4 4 4 3 3 4 3 3 3 4 4 4 5 4 5 5 4 4 4 3 3 3 3 3 4 4
5 5 5 5 5 5 5 4 4 4 4 4 4 3 3 4 4 4 7 4 3 3 3 5 4 5 4 4 4 4 3 3 3 3 3 5
6 5 6 5 4 4 4 3 4 4 4 4 4

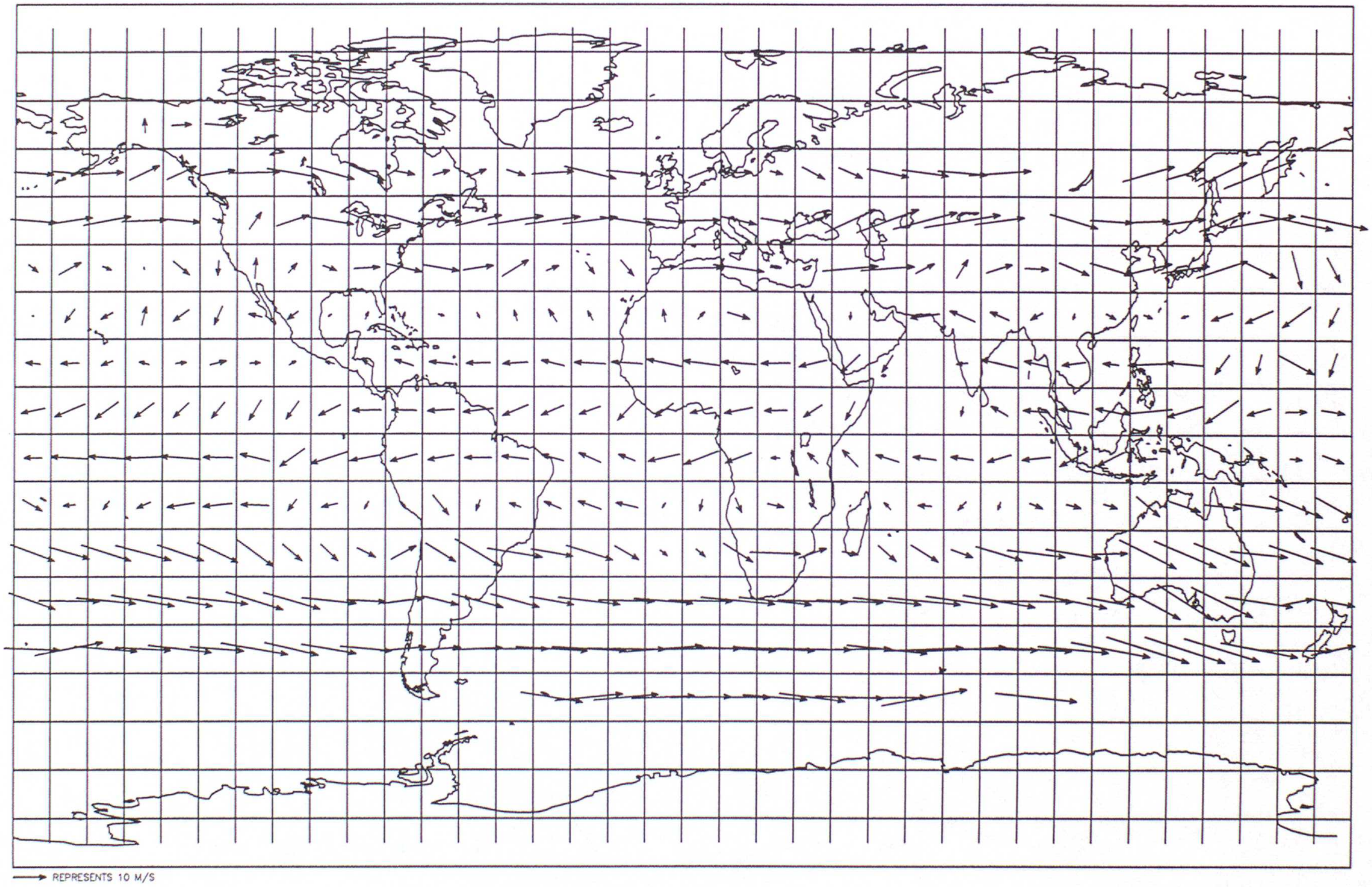
AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
SEPTEMBER 1998



		0	2	3	3	0		0	0	7	[illegible]	1																							
4	22	30	41	27	22	26	33	44	40	53	43	32	18	7	2	3	[illegible]	3	2	2	1	2	2	2	2	2	0			1	1	1			
22	33	38	40	31	2	55	48	38	[illegible]	39	[illegible]	23	22	26	9	2	4	3	[illegible]	3	2	2	2	2	2	1	0	2	5	9	7	5	4	2	4
13	19	34	84	72	41	56	78	27	17	19	36	22	14	13	19	3	1	2	4	1		1	2	1	1	4	4	3	3	2		1	2	4	11
5	5	10	38	69	48	12	53	16	10	7	9	8	14	35	23	2	2	3	2	1		2	1	1	1	3	4	5	2	2	2	3	4	5	11
6	8	9	13	24	24	16	16	6	5	4	8	17	21	15	9	3	3	4	2	4	4	6	1	1	4	4	4	3	2	1	1	1	1	1	1
21	40	36	49	47	29	27	27	13	14	18	19	22	32	36	5	5	3	4	3	3	6	3	1	1	2	2	4	3	8	2	1	1	1	1	2
20	25	19	5	3	4	1	12	8	22	27	11	13	22	7	2	3	3	4	3	2	2	3	5	2	4	5	7	[illegible]	5	4	1	3	2	2	2
10	19	33	17	14	47	40	107	159	70	10	12	15	12	16	16	11	20	16	5	1	2	3	13	14	19	13	13	9	3	2	2		1	2	3
26	19	20	26	27	50	64	76	73	64	16	7	14	15	25	26	8	14	20	10	3	5	3	10	8	14	13	14	9	2	5	6	5	3	3	21
29	42	49	56	46	52	62	30	25	35	16	14	11	21	28	17	6	8	9	6	5	6	7	6	9	8	7	7	12	7	8	6	6	5	8	11
11	15	13	13	12	13	30	23	22	23	18	10	12	17	29	15	8	10	11	13	14	14	9	5	5	6	8	7	7	15	20	20	19	17	11	4
														1	2	6	9	9	7	5	2	1	1	1	1	0	1								

SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA
SEPTEMBER 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16


REPRESENTS 10 M/S

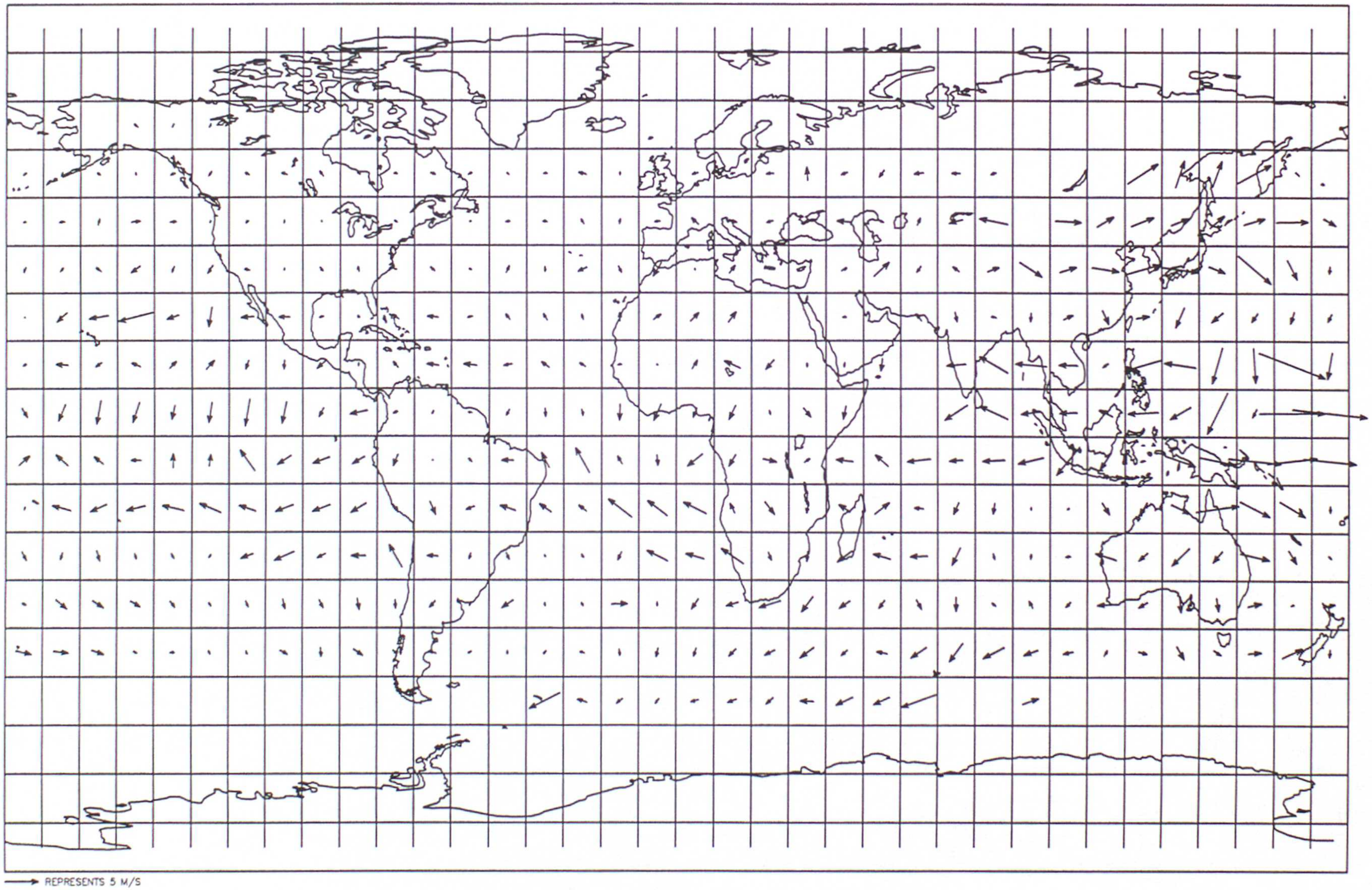
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA

FIGURE 17

SEPTEMBER 1998

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

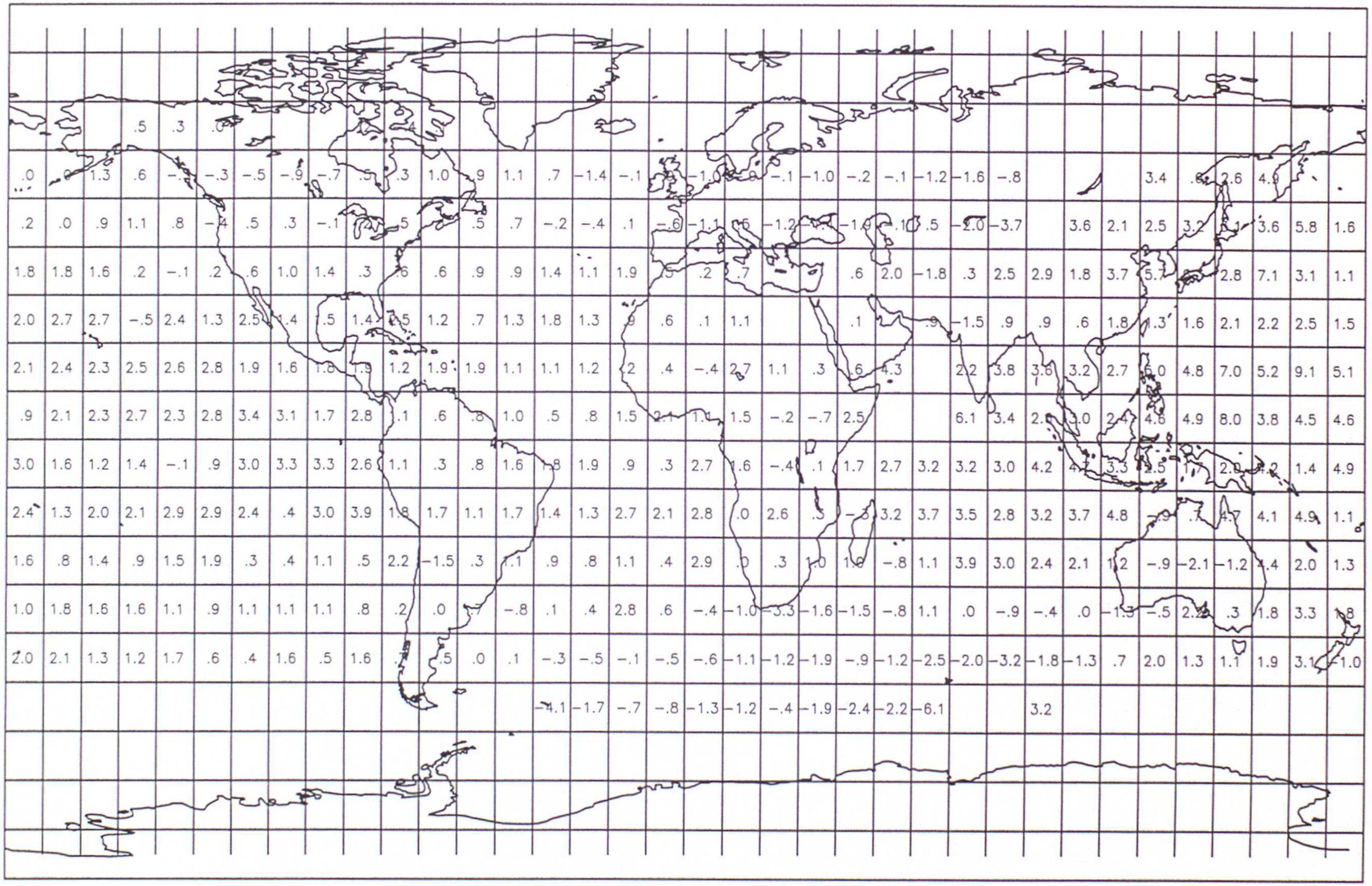


SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18

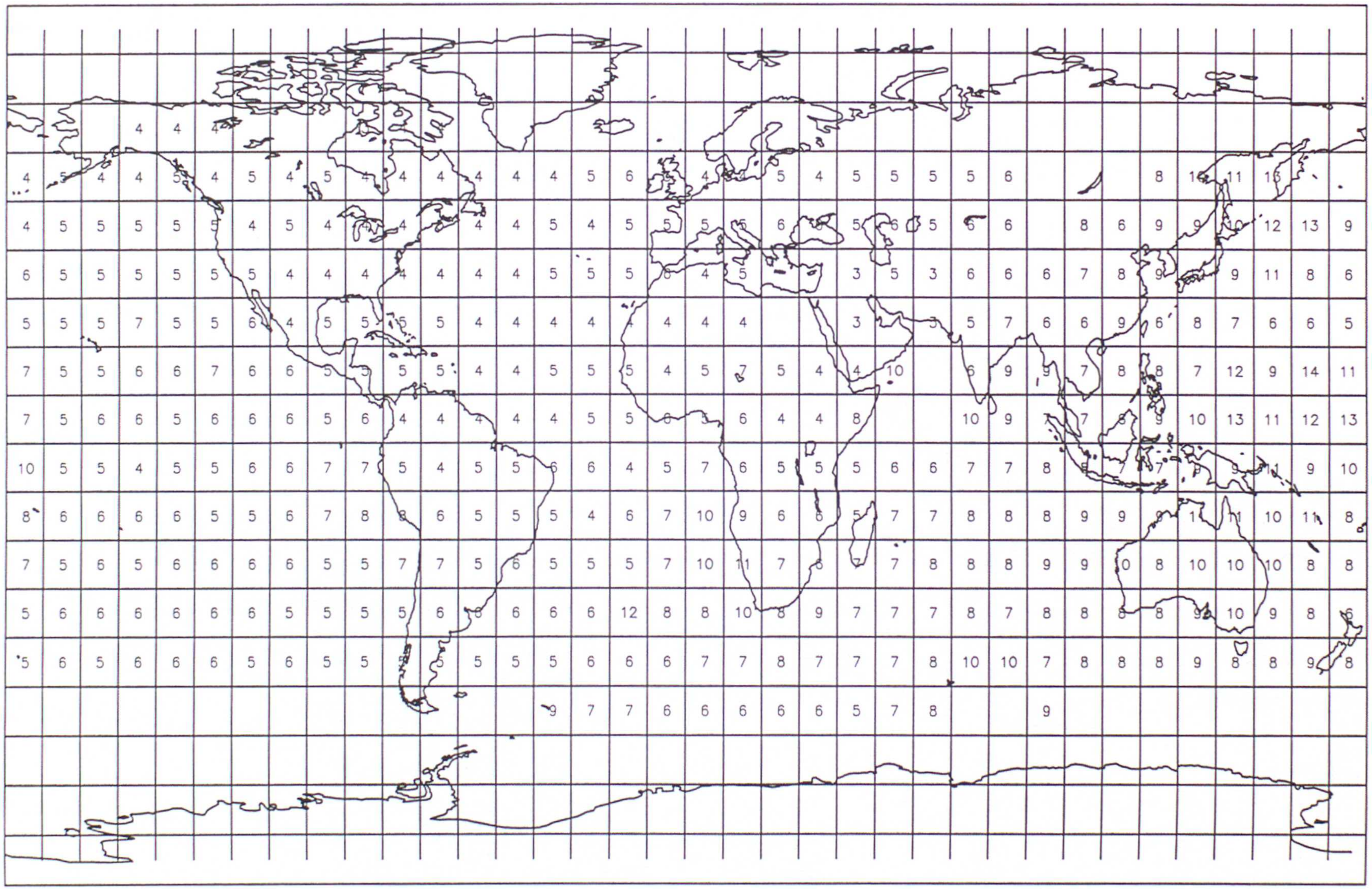
SEPTEMBER 1998

USING ALL OBSERVATIONS

VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

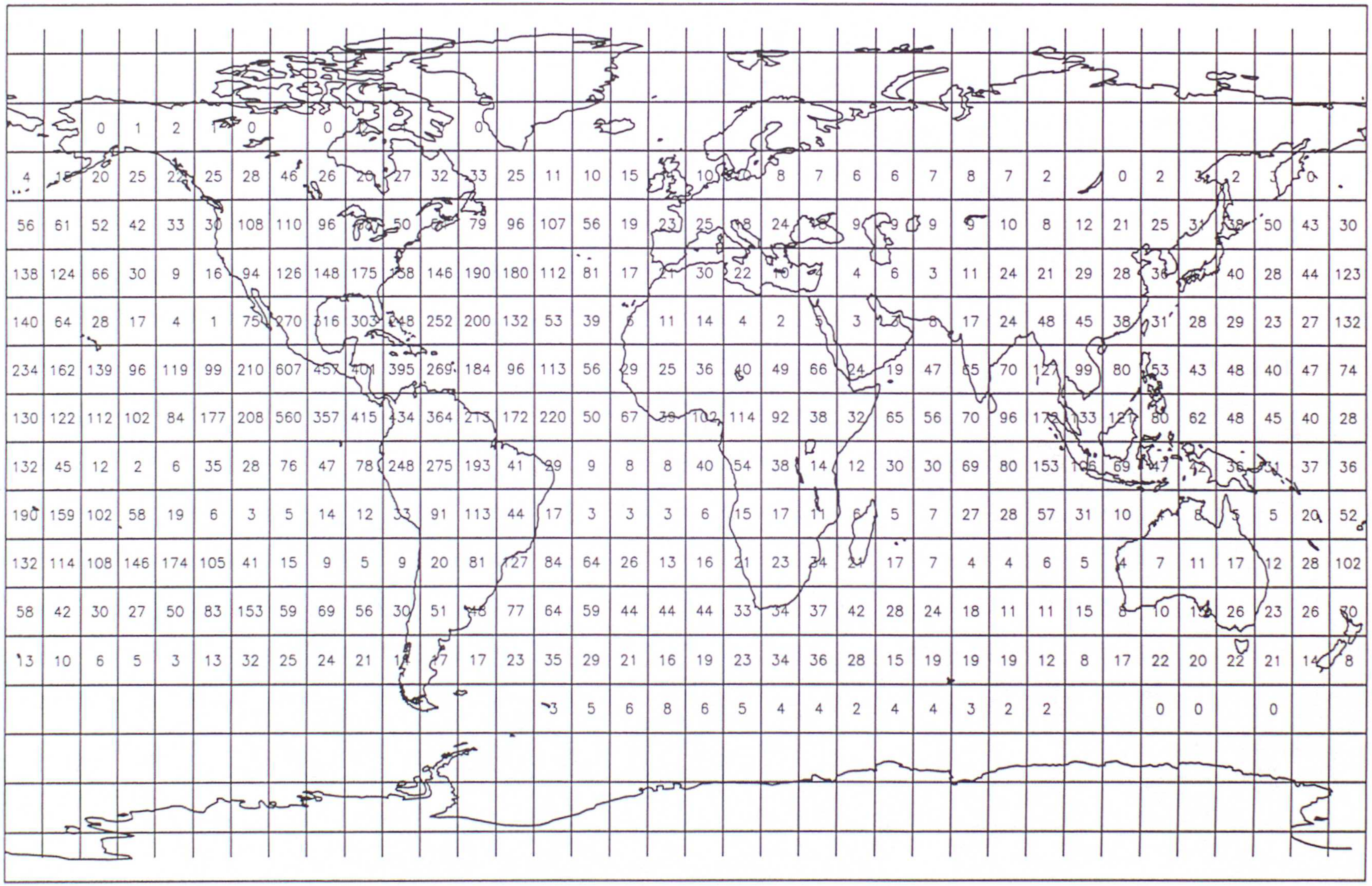

.5 .3 .0
.0 .0 1.3 .6 −.1 −.3 −.5 −.9 −.7 .5 .3 1.0 .9 1.1 .7 −1.4 −.1 −1.0 −.8 −.1 −1.0 −.2 −.1 −1.2 −1.6 −.8 3.4 .6 2.6 4.9
.2 .0 .9 1.1 .8 −.4 .5 .3 −.1 .2 .5 .5 .7 −.2 −.4 .1 −.6 −1.1 .5 −1.2 −1.4 −1.4 −.1 .5 −2.0 −3.7 3.6 2.1 2.5 3.2 3.1 3.6 5.8 1.6
1.8 1.8 1.6 .2 −.1 .2 .6 1.0 1.4 .3 .6 .6 .9 .9 1.4 1.1 1.9 .5 .2 .7 .6 2.0 −1.8 .3 2.5 2.9 1.8 3.7 5.7 2.8 7.1 3.1 1.1
2.0 2.7 2.7 −.5 2.4 1.3 2.5 1.4 1.5 1.4 2.5 1.2 .7 1.3 1.8 1.3 .9 .6 .1 1.1 .1 .9 −1.5 .9 .9 .6 1.8 1.3 1.6 2.1 2.2 2.5 1.5
2.1 2.4 2.3 2.5 2.6 2.8 1.9 1.6 1.8 1.9 1.2 1.9 1.9 1.1 1.1 1.2 .2 .4 −.4 2.7 1.1 .3 .6 4.3 2.2 3.8 3.6 3.2 2.7 6.0 4.8 7.0 5.2 9.1 5.1
.9 2.1 2.3 2.7 2.3 2.8 3.4 3.1 1.7 2.8 1.1 .6 .8 1.0 .5 .8 1.5 2.1 1.1 1.5 −.2 −.7 2.5 6.1 3.4 2.8 3.0 2.4 4.6 4.9 8.0 3.8 4.5 4.6
3.0 1.6 1.2 1.4 −.1 .9 3.0 3.3 3.3 2.6 1.1 .3 .8 1.6 1.8 1.9 .9 .3 2.7 1.6 −.4 .1 1.7 2.7 3.2 3.2 3.0 4.2 4.7 3.3 2.5 1.7 2.0 4.2 1.4 4.9
2.4 1.3 2.0 2.1 2.9 2.9 2.4 .4 3.0 3.9 1.8 1.7 1.1 1.7 1.4 1.3 2.7 2.1 2.8 .0 2.6 .3 −.3 3.2 3.7 3.5 2.8 3.2 3.7 4.8 −.9 .7 4.7 4.1 4.9 1.1
1.6 .8 1.4 .9 1.5 1.9 .3 .4 1.1 .5 2.2 −1.5 .3 1.1 .9 .8 1.1 .4 2.9 .0 .3 1.0 1.0 −.8 1.1 3.9 3.0 2.4 2.1 1.2 −.9 −2.1 −1.2 .4 2.0 1.3
1.0 1.8 1.6 1.6 1.1 .9 1.1 1.1 1.1 .8 .2 .0 .7 −.8 .1 .4 2.8 .6 −.4 −1.0 −3.3 −1.6 −1.5 −.8 1.1 .0 −.9 −.4 .0 −1.3 −.5 2.2 .3 1.8 3.3 1.8
2.0 2.1 1.3 1.2 1.7 .6 .4 1.6 .5 1.6 .7 .5 .0 .1 −.3 −.5 −.1 −.5 −.6 −1.1 −1.2 −1.9 −.9 −1.2 −2.5 −2.0 −3.2 −1.8 −1.3 .7 2.0 1.3 1.1 1.9 3.1 −1.0
−4.1 −1.7 −.7 −.8 −1.3 −1.2 −.4 −1.9 −2.4 −2.2 −6.1 3.2

SATOBS : RMS O−B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
SEPTEMBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



			4	4	4																														
4	5	4	4	5	4	5	4	5	4	4	4	4	4	4	5	6	5	4	4	5	4	5	5	5	5	6				8	10	11	13		
4	5	5	5	5	5	4	5	4	4	4		4	4	5	4	5	5	5	5	6	6	5	6	5	6	6		8	6	9	9	10	12	13	9
6	5	5	5	5	5	5	4	4	4	4	4	4	4	5	5	5	6	4	5			3	5	3	6	6	6	7	8	9		9	11	8	6
5	5	5	7	5	5	6	4	5	5	5	5	4	4	4	4	4	4	4	4			3		3	5	7	6	6	9	6	8	7	6	6	5
7	5	5	6	6	7	6	6	5	5	5	5	4	4	5	5	5	4	5	7	5	4	4	10		6	9	9	7	8	8	7	12	9	14	11
7	5	6	6	5	6	6	6	5	6	4	4	4	4	4	5	5	6	5	6	4	4	8			10	9	7	7	8	9	10	13	11	12	13
10	5	5	4	5	5	6	6	7	7	5	4	5	5	6	6	4	5	7	6	5	5	5	6	6	7	7	8	8	7	7	9	9	11	9	10
8	6	6	6	6	5	5	6	7	8	8	6	5	5	5	4	6	7	10	9	6	6	5	7	7	8	8	8	9	9	9	11	11	10	11	8
7	5	6	5	6	6	6	6	5	5	7	7	5	6	5	5	5	7	10	11	7	6	7	7	8	8	8	9	9	10	8	10	10	10	8	8
5	6	6	6	6	6	6	5	5	5	5	6	6	6	6	6	12	8	8	10	8	9	7	7	7	8	7	8	8	8	8	9	10	9	8	6
5	6	5	6	6	6	5	6	5	5	5	5	5	5	5	6	6	6	7	7	8	7	7	7	8	10	10	7	8	8	8	9	8	8	9	8
														9	7	7	6	6	6	6	6	5	7	8			9								

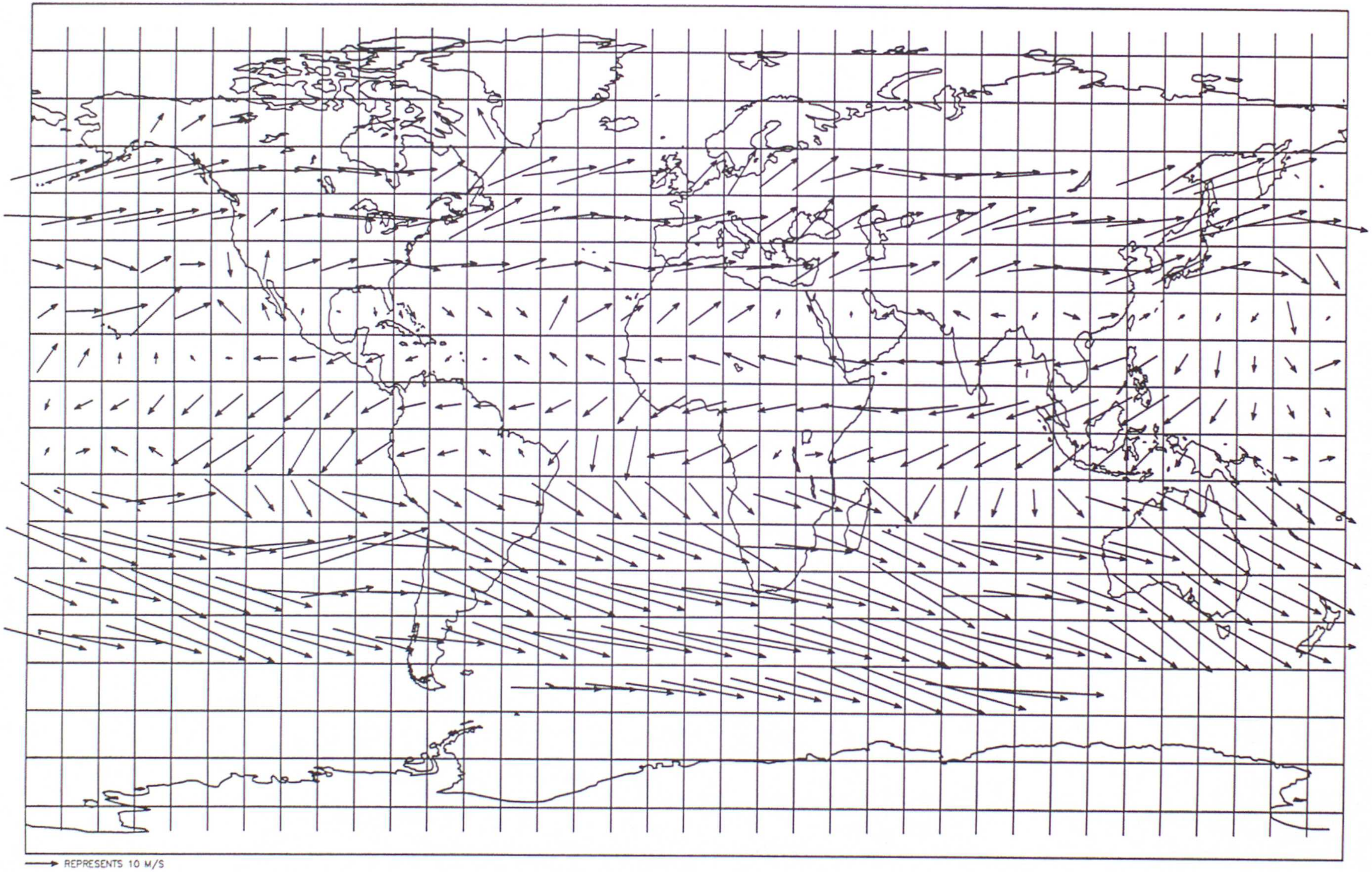
AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
SEPTEMBER 1998



		0	1	2	1	0		0				0																							
4	15	20	25	22	25	28	46	26	20	27	32	33	25	11	10	15	[illegible]	10	10	8	7	6	6	7	8	7	2		0	2	3	2	3	0	
56	61	52	42	33	30	108	110	96	[illegible]	50	[illegible]	79	96	107	56	19	23	25	18	24	[illegible]	9	9	9	9	10	8	12	21	25	31	38	50	43	30
138	124	66	30	9	16	94	126	148	175	158	146	190	180	112	81	17	21	30	22	10	4	4	6	3	11	24	21	29	28	36	[illegible]	40	28	44	123
140	64	28	17	4	1	75	270	316	303	248	252	200	132	53	39	6	11	14	4	2	5	3	[illegible]	8	17	24	48	45	38	31	28	29	23	27	132
234	162	139	96	119	99	210	607	457	401	395	269	184	96	113	56	29	25	36	40	49	66	24	19	47	65	70	127	99	80	53	43	48	40	47	74
130	122	112	102	84	177	208	560	357	415	434	364	213	172	220	50	67	39	102	114	92	38	32	65	56	70	96	172	133	121	80	62	48	45	40	28
132	45	12	2	6	35	28	76	47	78	248	275	193	41	29	9	8	8	40	54	38	14	12	30	30	69	80	153	106	69	47	42	36	31	37	36
190	159	102	58	19	6	3	5	14	12	33	91	113	44	17	3	3	3	6	15	17	11	6	5	7	27	28	57	31	10	4	8	5	5	20	52
132	114	108	146	174	105	41	15	9	5	9	20	81	127	84	64	26	13	16	21	23	34	21	17	7	4	4	6	5	4	7	11	17	12	28	102
58	42	30	27	50	83	153	59	69	56	30	51	48	77	64	59	44	44	44	33	34	37	42	28	24	18	11	11	15	8	10	13	26	23	26	30
13	10	6	5	3	13	32	25	24	21	14	17	17	23	35	29	21	16	19	23	34	36	28	15	19	19	19	12	8	17	22	20	22	21	14	8
														3	5	6	8	6	5	4	4	2	4	4	3	2	2			0	0		0		

SATOB VECTOR MEAN WINDS BETWEEN 101–400 HPA
SEPTEMBER 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 21


REPRESENTS 10 M/S

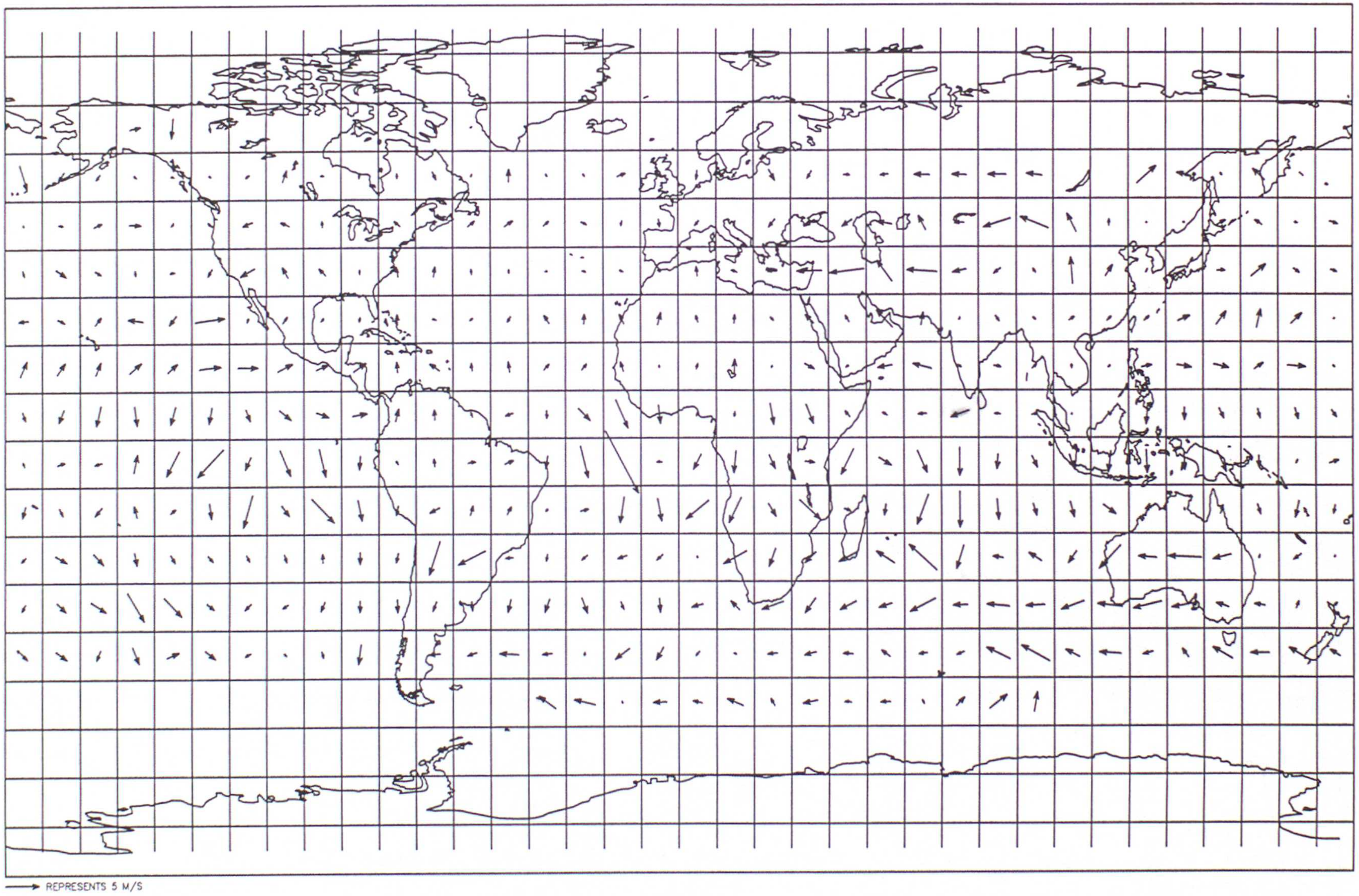
SATOB O−B VECTOR WIND DIFFERENCES BETWEEN 101−400 HPA

SEPTEMBER 1998

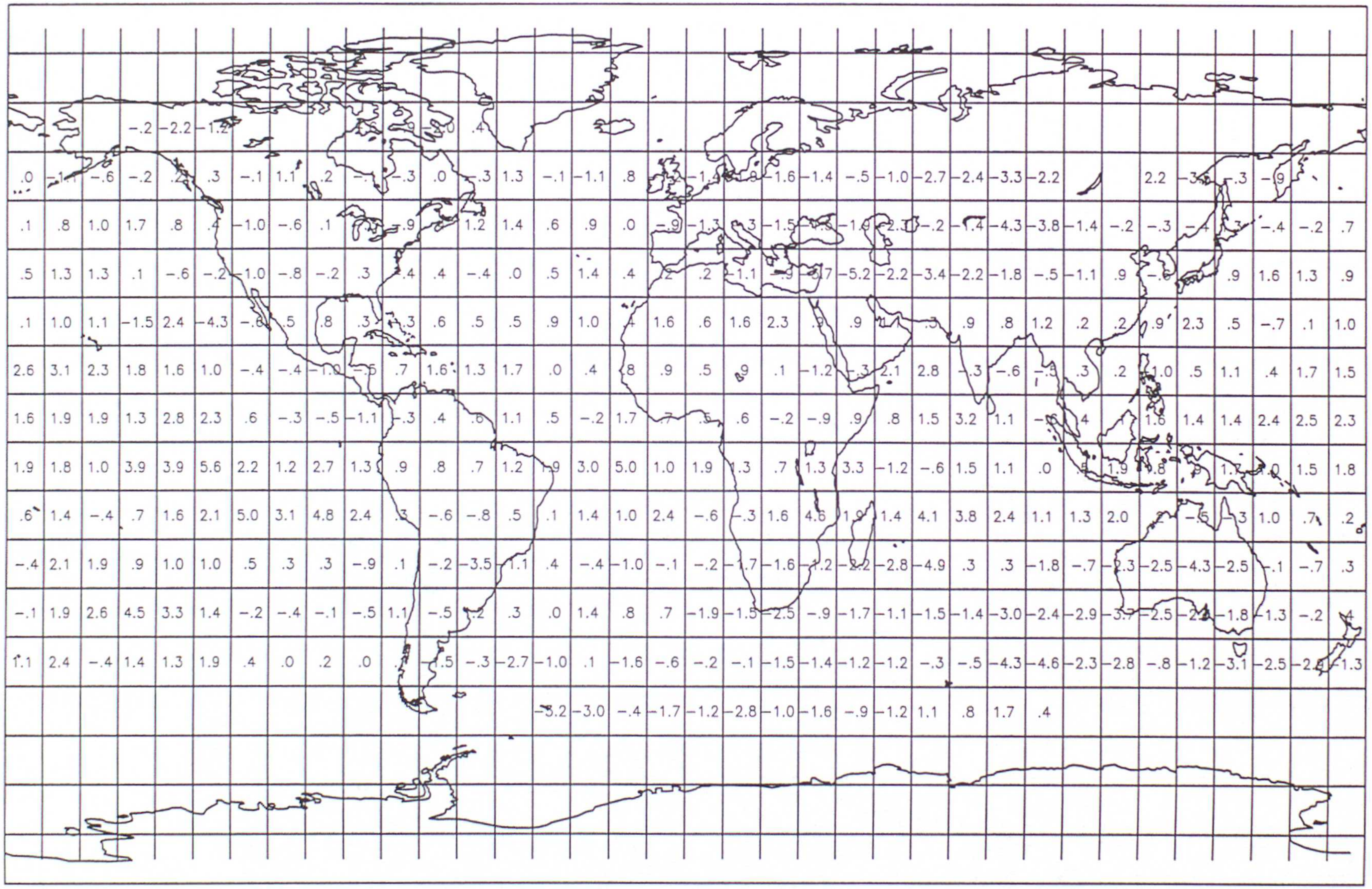
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

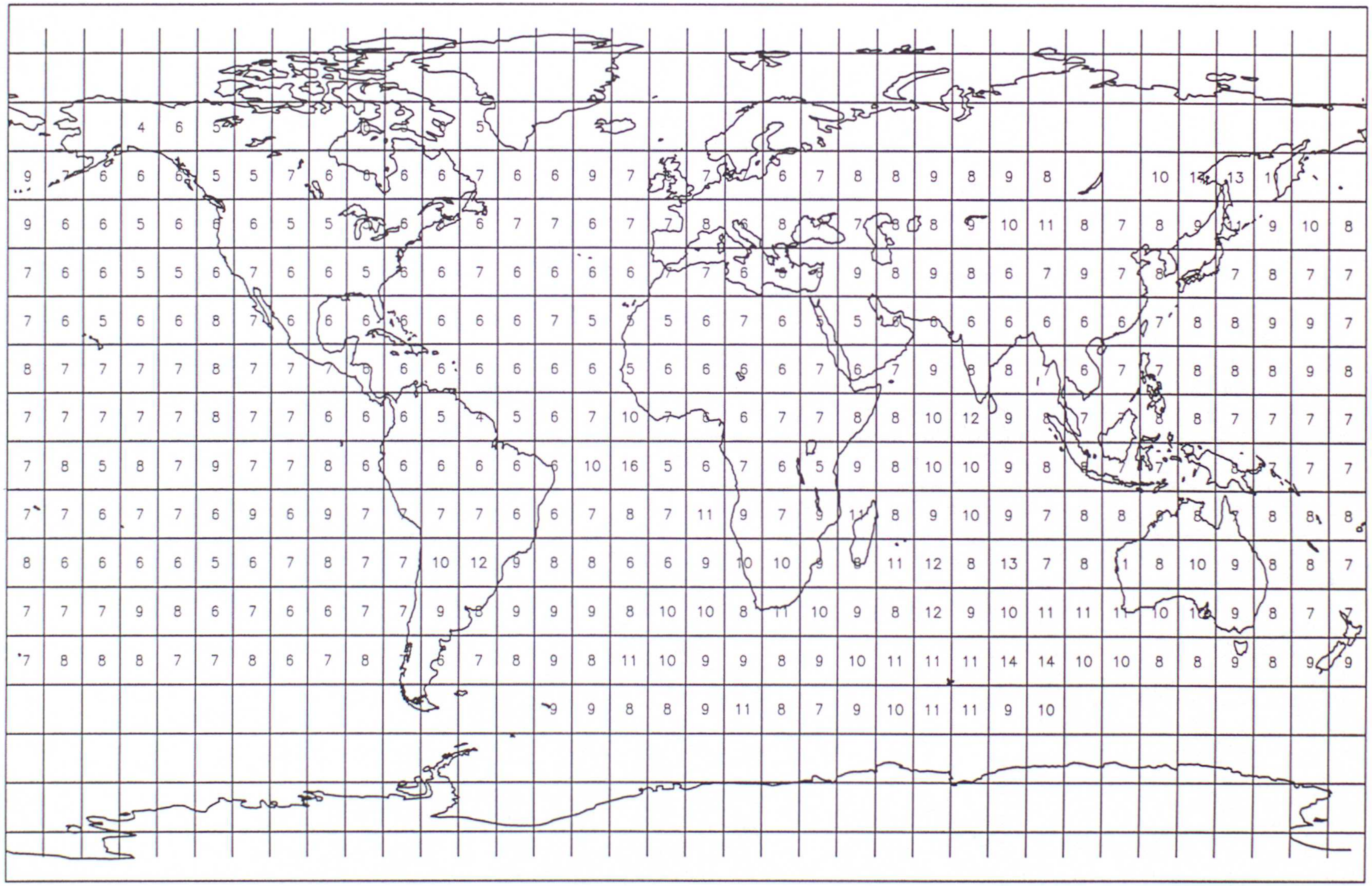
FIGURE 22



SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
SEPTEMBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-.2 -2.2 -1.2 .4
.0 -1.1 -.6 -.2 .2 .3 -.1 1.1 .2 -.1 -.3 .0 -.3 1.3 -.1 -1.1 .8 -.2 -1.4 -1.8 -1.6 -1.4 -.5 -1.0 -2.7 -2.4 -3.3 -2.2 2.2 -3.6 -.3 -.9
.1 .8 1.0 1.7 .8 .4 -1.0 -.6 .1 -1.3 -.9 .4 1.2 1.4 .6 .9 .0 -.9 -1.3 -.3 -1.5 -1.5 -1.9 -2.3 -.2 -1.4 -4.3 -3.8 -1.4 -.2 -.3 -.4 -.3 -.4 -.2 .7
.5 1.3 1.3 .1 -.6 -.2 -1.0 -.8 -.2 .3 .4 .4 -.4 .0 .5 1.4 .4 .2 .2 -1.1 -.9 -3.7 -5.2 -2.2 -3.4 -2.2 -1.8 -.5 -1.1 .9 -.6 .9 1.6 1.3 .9
.1 1.0 1.1 -1.5 2.4 -4.3 -.6 .5 .8 .3 -.3 .6 .5 .5 .9 1.0 .4 1.6 .6 1.6 2.3 .9 .9 1.1 -.3 .9 .8 1.2 .2 .2 .9 2.3 .5 -.7 .1 1.0
2.6 3.1 2.3 1.8 1.6 1.0 -.4 -.4 -1.0 -.5 .7 1.6 1.3 1.7 .0 .4 .8 .9 .5 .9 .1 -1.2 -.3 2.1 2.8 -.3 -.6 -.5 .3 .2 1.0 .5 1.1 .4 1.7 1.5
1.6 1.9 1.9 1.3 2.8 2.3 .6 -.3 -.5 -1.1 -.3 .4 .6 1.1 .5 -.2 1.7 .7 .5 .6 -.2 -.9 .9 .8 1.5 3.2 1.1 -.6 .4 .1 1.6 1.4 1.4 2.4 2.5 2.3
1.9 1.8 1.0 3.9 3.9 5.6 2.2 1.2 2.7 1.3 .9 .8 .7 1.2 1.9 3.0 5.0 1.0 1.9 1.3 .7 1.3 3.3 -1.2 -.6 1.5 1.1 .0 .5 1.9 1.8 .9 1.7 1.0 1.5 1.8
.6 1.4 -.4 .7 1.6 2.1 5.0 3.1 4.8 2.4 .3 -.6 -.8 .5 .1 1.4 1.0 2.4 -.6 -.3 1.6 4.6 1.9 1.4 4.1 3.8 2.4 1.1 1.3 2.0 .2 -.5 .3 1.0 .7 .2
-.4 2.1 1.9 .9 1.0 1.0 .5 .3 .3 -.9 .1 -.2 -3.5 1.1 .4 -.4 -1.0 -.1 -.2 -1.7 -1.6 -1.2 -2.2 -2.8 -4.9 .3 .3 -1.8 -.7 -2.3 -2.5 -4.3 -2.5 -.1 -.7 .3
-.1 1.9 2.6 4.5 3.3 1.4 -.2 -.4 -.1 -.5 1.1 -.5 .2 .3 .0 1.4 .8 .7 -1.9 -1.5 -2.5 -.9 -1.7 -1.1 -1.5 -1.4 -3.0 -2.4 -2.9 -3.7 -2.5 -2.4 -1.8 -1.3 -.2 .4
1.1 2.4 -.4 1.4 1.3 1.9 .4 .0 .2 .0 .5 -.3 -2.7 -1.0 .1 -1.6 -.6 -.2 -.1 -1.5 -1.4 -1.2 -1.2 -.3 -.5 -4.3 -4.6 -2.3 -2.8 -.8 -1.2 -3.1 -2.5 -2.4 -1.3
-3.2 -3.0 -.4 -1.7 -1.2 -2.8 -1.0 -1.6 -.9 -1.2 1.1 .8 1.7 .4

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
SEPTEMBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


4 6 5 5
9 7 6 6 6 5 5 7 6 6 6 6 7 6 6 9 7 6 7 7 6 7 8 8 9 8 9 8 10 13 13 1
9 6 6 5 6 6 6 5 5 5 6 6 7 7 6 7 7 8 6 8 7 7 8 8 9 10 11 8 7 8 9 11 9 10 8
7 6 6 5 5 6 7 6 6 5 6 6 7 6 6 6 6 7 7 6 6 6 9 8 9 8 6 7 9 7 8 7 8 7 7
7 6 5 6 6 8 7 6 6 6 6 6 6 6 7 5 5 5 6 7 6 5 5 8 6 6 6 6 6 6 7 8 8 9 9 7
8 7 7 7 7 8 7 7 7 6 6 6 6 6 6 6 5 6 6 6 6 7 6 7 9 8 8 7 6 7 7 8 8 8 9 8
7 7 7 7 7 8 7 7 6 6 6 5 4 5 6 7 10 7 8 6 7 7 8 8 10 12 9 8 7 7 8 8 7 7 7 7
7 8 5 8 7 9 7 7 8 6 6 6 6 6 6 10 16 5 6 7 6 5 9 8 10 10 9 8 8 7 7 7 8 7 7 7
7 7 6 7 7 6 9 6 9 7 7 7 7 6 6 7 8 7 11 9 7 9 11 8 9 10 9 7 8 8 8 8 7 8 8 8
8 6 6 6 6 5 6 7 8 7 7 10 12 9 8 8 6 6 9 10 10 9 8 11 12 8 13 7 8 11 8 10 9 8 8 7
7 7 7 9 8 6 7 6 6 7 7 9 8 9 9 9 8 10 10 8 11 10 9 8 12 9 10 11 11 11 10 10 9 8 7 7
7 8 8 8 7 7 8 6 7 8 7 6 7 8 9 8 11 10 9 9 8 9 10 11 11 11 14 14 10 10 8 8 9 8 9 9
9 9 8 8 9 11 8 7 9 10 11 11 9 10

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: September 1998

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from NOAA-11, NOAA-14 500 km.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:All SATEM soundings where number of observations > 30.
Data Extracted	:Layer: 850 - 1000 hPa 100 - 300 hPa 30 - 50 hPa :Mean observation minus background temperature differences

NO DATA AVAILABLE

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13502	16.4	-46.0	ALL	P	SUR	233	0	0	0.8	0.0	0.8
13503	18.7	-49.3	ALL	P	SUR	245	0	0	0.7	-0.5	0.9
13906	25.3	-48.0	ALL	P	SUR	232	0	0	0.8	-0.4	0.9
13912	17.9	-66.4	ALL	P	SUR	4	0	0	1.0	-1.6	1.9
13913	14.7	-61.2	ALL	P	SUR	135	0	0	1.3	-1.2	1.8
19809	21.5	-46.3	ALL	P	SUR	2	0	0	0.3	1.3	1.3
41502	21.3	-44.4	ALL	P	SUR	205	0	0	0.8	0.1	0.8
41503	20.4	-58.6	ALL	P	SUR	251	0	0	0.9	0.1	0.9
41504	26.4	-65.8	ALL	P	SUR	275	0	0	0.9	0.1	0.9
41505	25.9	-67.9	ALL	P	SUR	267	0	0	0.9	0.3	0.9
41520	21.3	-44.7	ALL	P	SUR	234	0	0	0.8	0.5	1.0
41521	25.5	-58.9	ALL	P	SUR	274	0	0	0.9	0.0	0.9
41528	26.8	-69.9	ALL	P	SUR	275	0	0	0.8	0.3	0.9
41597	31.8	-24.0	ALL	P	SUR	581	0	0	0.7	-0.1	0.7
41598	23.7	-45.7	ALL	P	SUR	696	18	3	0.8	0.3	0.9
41599	22.7	-39.9	ALL	P	SUR	626	13	2	0.9	-0.4	1.0
41601	18.8	-45.0	ALL	P	SUR	813	26	3	1.0	0.4	1.1
41625	30.6	-68.7	ALL	P	SUR	284	0	0	0.8	0.2	0.8
41626	28.0	-74.5	ALL	P	SUR	276	0	0	0.9	0.3	0.9
41629	27.1	-69.4	ALL	P	SUR	274	0	0	0.9	0.2	0.9
41633	13.5	-52.4	ALL	P	SUR	523	32	6	1.1	0.3	1.1
41635	24.7	-52.4	ALL	P	SUR	590	7	1	1.2	1.1	1.6
41636	18.0	-50.1	ALL	P	SUR	802	55	7	1.0	0.0	1.0
41637	23.1	-47.8	ALL	P	SUR	365	10	3	0.8	-0.1	0.8
41638	20.2	-57.8	ALL	P	SUR	578	5	1	1.3	0.2	1.3
41924	23.1	-55.2	ALL	P	SUR	150	0	0	1.2	-3.3	3.5
44601	54.1	-43.5	ALL	P	SUR	765	81	11	1.6	1.0	1.9
44602	52.5	-35.6	ALL	P	SUR	744	49	7	1.3	0.3	1.4
44603	53.3	-43.6	ALL	P	SUR	881	0	0	1.4	0.0	1.4
44604	44.9	-32.8	ALL	P	SUR	601	0	0	1.5	0.5	1.6
44606	53.0	-40.5	ALL	P	SUR	1078	1	0	1.5	-0.1	1.5
44609	59.0	-21.6	ALL	P	SUR	526	0	0	1.5	0.2	1.5
44613	40.2	-34.3	ALL	P	SUR	674	4	1	1.6	0.1	1.6
44617	55.3	-10.4	ALL	P	SUR	1129	3	0	0.9	-0.1	1.0
44621	54.6	-8.4	ALL	P	SUR	257	1	0	1.0	-1.0	1.5
44726	54.8	-36.6	ALL	P	SUR	1156	7	1	1.6	-0.2	1.6
44727	59.8	-15.9	ALL	P	SUR	1432	9	1	1.2	-0.2	1.2
44742	45.0	-26.3	ALL	P	SUR	738	3	0	1.9	-0.2	1.9
44743	45.1	-50.8	ALL	P	SUR	690	8	1	2.5	0.3	2.5
44744	43.8	-60.7	ALL	P	SUR	1	0	0	0.0	0.9	0.9
44767	52.4	-48.4	ALL	P	SUR	919	5	1	1.9	-0.5	1.9
44768	57.6	-14.9	ALL	P	SUR	1234	3	0	1.0	0.0	1.0
44770	57.8	-37.0	ALL	P	SUR	1394	1	0	1.1	-0.6	1.3
44772	48.9	-36.7	ALL	P	SUR	641	1	0	3.1	-0.4	3.1
44773	56.6	-11.0	ALL	P	SUR	1190	4	0	0.9	-0.2	1.0
44774	51.1	-34.9	ALL	P	SUR	872	6	1	1.7	-1.3	2.1
44775	56.4	-33.6	ALL	P	SUR	1203	5	0	1.4	0.0	1.4
44776	49.6	-42.8	ALL	P	SUR	828	2	0	1.6	-0.1	1.6
44778	52.4	-52.8	ALL	P	SUR	948	2	0	1.6	0.0	1.6
44779	45.0	-42.4	ALL	P	SUR	796	1	0	1.5	-0.2	1.6
44780	58.8	-14.3	ALL	P	SUR	1275	6	0	1.0	0.1	1.0
44901	55.5	-45.6	ALL	P	SUR	170	2	1	1.4	1.1	1.8
44912	53.3	-26.3	ALL	P	SUR	121	1	1	2.5	1.0	2.6
44925	54.9	-50.8	ALL	P	SUR	164	5	3	4.6	-1.3	4.7
48518	72.7	-20.5	ALL	P	SUR	639	0	0	0.9	-0.7	1.2
62506	47.3	-8.1	ALL	P	SUR	551	0	0	1.1	-0.2	1.1
62508	46.6	-7.0	ALL	P	SUR	369	0	0	0.9	0.0	0.9
62509	45.4	-4.1	ALL	P	SUR	65	0	0	0.7	-0.1	0.7
62510	45.5	-5.1	ALL	P	SUR	695	0	0	1.0	0.1	1.0
62511	47.5	-18.9	ALL	P	SUR	116	0	0	1.1	0.5	1.2

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
62512	47.5	-18.9	ALL	P	SUR	112	0	0	1.0	0.0	1.0
62513	46.5	-19.1	ALL	P	SUR	106	0	0	0.9	0.0	0.9
62514	53.4	-33.5	ALL	P	SUR	536	0	0	1.2	0.4	1.2
62515	57.8	-34.7	ALL	P	SUR	1245	0	0	1.2	0.3	1.2
62516	45.5	-11.7	ALL	P	SUR	204	0	0	1.7	1.3	2.2
62517	50.6	-18.8	ALL	P	SUR	57	0	0	1.5	-1.8	2.4
62518	48.6	-18.9	ALL	P	SUR	280	2	1	2.1	0.8	2.2
62519	44.9	-19.1	ALL	P	SUR	298	0	0	0.9	-0.3	1.0
62520	44.0	-17.9	ALL	P	SUR	219	0	0	1.2	-0.5	1.3
62554	47.2	-17.6	ALL	P	SUR	241	0	0	1.0	-0.2	1.0
62674	63.4	-19.8	ALL	P	SUR	299	0	0	1.2	-0.5	1.3
62758	44.6	-23.9	ALL	P	SUR	47	0	0	2.2	0.0	2.2
62780	54.8	-4.8	ALL	P	SUR	1	0	0	0.0	0.4	0.4
62803	51.3	-47.9	ALL	P	SUR	21	0	0	1.2	-0.1	1.2
63666	65.9	-32.0	ALL	P	SUR	46	0	0	1.0	0.2	1.1
64528	58.1	-12.3	ALL	P	SUR	1600	2	0	1.0	-0.5	1.2
64529	63.0	-32.9	ALL	P	SUR	1302	5	0	1.3	-0.8	1.5
64561	48.8	-6.4	ALL	P	SUR	731	3	0	1.2	0.0	1.2
64563	59.4	-24.3	ALL	P	SUR	1535	1	0	1.4	-0.8	1.6
65562	59.0	-7.6	ALL	P	SUR	1639	2	0	1.0	-0.5	1.1
65571	59.6	-26.6	ALL	P	SUR	1389	11	1	1.3	-0.6	1.4
65581	57.9	-37.5	ALL	P	SUR	690	0	0	1.2	-0.4	1.3
65591	57.4	-42.1	ALL	P	SUR	911	4	0	1.4	-0.4	1.5
65592	63.9	-28.0	ALL	P	SUR	1421	7	0	1.1	-0.5	1.3
65597	54.8	-11.7	ALL	P	SUR	1317	11	1	1.1	-0.6	1.3
65599	59.3	-35.9	ALL	P	SUR	25	0	0	0.9	0.0	0.9
71548	41.6	-70.6	ALL	P	SUR	1	1	100	0.0	0.0	0.0
WIND SPEED											
13502	16.4	-46.0	ALL	SPEED	SUR	309	0	0	2.1	-0.3	2.1
13503	18.7	-49.3	ALL	SPEED	SUR	320	0	0	1.2	-1.5	1.9
19809	21.5	-46.3	ALL	SPEED	SUR	2	0	0	0.8	1.1	1.4
33680	33.6	-72.4	ALL	SPEED	SUR	2	0	0	0.1	0.7	0.8
41501	21.4	-46.3	ALL	SPEED	SUR	332	0	0	1.5	-0.4	1.6
41502	21.3	-44.4	ALL	SPEED	SUR	203	0	0	2.0	-5.8	6.2
41504	26.4	-65.8	ALL	SPEED	SUR	367	0	0	2.0	-0.4	2.0
41520	21.3	-44.7	ALL	SPEED	SUR	289	0	0	2.5	1.2	2.8
41521	25.5	-58.9	ALL	SPEED	SUR	436	0	0	2.0	0.3	2.0
41522	13.4	-58.9	ALL	SPEED	SUR	296	0	0	2.7	-1.0	2.9
41523	20.4	-58.7	ALL	SPEED	SUR	329	1	0	2.2	-1.3	2.6
41598	23.7	-45.7	ALL	SPEED	SUR	831	0	0	1.3	-0.5	1.3
41599	22.7	-39.9	ALL	SPEED	SUR	600	1	0	2.1	-0.4	2.2
41601	18.8	-45.0	ALL	SPEED	SUR	731	0	0	1.4	-0.2	1.4
41625	30.6	-68.7	ALL	SPEED	SUR	377	0	0	1.6	-0.2	1.6
41626	28.0	-74.5	ALL	SPEED	SUR	404	0	0	1.9	-1.6	2.5
41629	27.1	-69.4	ALL	SPEED	SUR	412	0	0	1.7	-0.2	1.7
41633	13.5	-52.4	ALL	SPEED	SUR	474	1	0	2.2	0.3	2.2
41635	24.7	-52.4	ALL	SPEED	SUR	396	0	0	2.9	0.7	3.0
41636	18.0	-50.1	ALL	SPEED	SUR	731	1	0	1.5	-0.4	1.5
41637	23.1	-47.8	ALL	SPEED	SUR	364	0	0	1.4	0.5	1.5
41638	20.2	-57.8	ALL	SPEED	SUR	494	0	0	1.5	-0.5	1.6
44601	54.1	-43.5	ALL	SPEED	SUR	598	0	0	3.0	1.4	3.3
44602	52.5	-35.6	ALL	SPEED	SUR	514	0	0	2.5	1.3	2.8
44609	59.0	-21.6	ALL	SPEED	SUR	459	0	0	4.5	-0.1	4.5
44613	40.2	-34.3	ALL	SPEED	SUR	1	0	0	0.0	41.6	41.6
44617	55.3	-10.4	ALL	SPEED	SUR	2	0	0	15.8	21.7	26.8
44744	43.8	-60.7	ALL	SPEED	SUR	2	0	0	0.0	2.2	2.2
44768	57.6	-14.9	ALL	SPEED	SUR	1	0	0	0.0	1.3	1.3
44773	56.6	-11.0	ALL	SPEED	SUR	1649	0	0	2.6	-2.9	3.9

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED											
62517	50.6	-18.8	ALL	SPEED	SUR	65	0	0	1.4	0.1	1.4
62674	63.4	-19.8	ALL	SPEED	SUR	12	0	0	0.6	-2.6	2.6
62758	44.6	-23.9	ALL	SPEED	SUR	190	1	1	6.9	-6.9	9.7
64529	63.0	-32.9	ALL	SPEED	SUR	1	0	0	0.0	1.3	1.3
65599	59.3	-35.9	ALL	SPEED	SUR	33	0	0	1.7	0.0	1.7
WIND DIRECTION											
13502	16.4	-46.0	ALL	DIRN.	SUR	141	0	0	17.8	-14.4	22.9
13503	18.7	-49.3	ALL	DIRN.	SUR	153	0	0	16.3	9.6	18.9
19809	21.5	-46.3	ALL	DIRN.	SUR	2	0	0	10.9	11.8	16.1
33680	33.6	-72.4	ALL	DIRN.	SUR	2	0	0	2.4	7.5	7.9
41501	21.4	-46.3	ALL	DIRN.	SUR	140	0	0	16.0	-6.5	17.3
41502	21.3	-44.4	ALL	DIRN.	SUR	107	0	0	20.7	-4.5	21.1
41503	20.4	-58.6	ALL	DIRN.	SUR	246	0	0	33.6	15.7	37.1
41504	26.4	-65.8	ALL	DIRN.	SUR	142	0	0	39.9	12.1	41.7
41520	21.3	-44.7	ALL	DIRN.	SUR	171	0	0	16.7	-8.6	18.8
41521	25.5	-58.9	ALL	DIRN.	SUR	102	0	0	22.2	-5.2	22.8
41522	13.4	-58.9	ALL	DIRN.	SUR	105	0	0	20.4	-8.6	22.1
41523	20.4	-58.7	ALL	DIRN.	SUR	81	1	1	14.6	8.2	16.7
41598	23.7	-45.7	ALL	DIRN.	SUR	157	0	0	22.6	-0.4	22.6
41599	22.7	-39.9	ALL	DIRN.	SUR	282	1	0	21.0	1.7	21.0
41601	18.8	-45.0	ALL	DIRN.	SUR	378	0	0	15.0	-3.2	15.3
41625	30.6	-68.7	ALL	DIRN.	SUR	171	0	0	25.3	17.5	30.8
41626	28.0	-74.5	ALL	DIRN.	SUR	131	0	0	29.6	-7.8	30.6
41629	27.1	-69.4	ALL	DIRN.	SUR	125	0	0	39.9	-2.1	39.9
41633	13.5	-52.4	ALL	DIRN.	SUR	219	1	0	18.1	10.3	20.8
41636	18.0	-50.1	ALL	DIRN.	SUR	346	1	0	27.8	6.5	28.5
41637	23.1	-47.8	ALL	DIRN.	SUR	128	0	0	16.9	-2.6	17.1
41638	20.2	-57.8	ALL	DIRN.	SUR	251	0	0	20.5	3.8	20.9
44601	54.1	-43.5	ALL	DIRN.	SUR	338	0	0	27.3	13.7	30.6
44602	52.5	-35.6	ALL	DIRN.	SUR	357	0	0	30.1	3.9	30.4
44609	59.0	-21.6	ALL	DIRN.	SUR	313	0	0	20.5	-3.2	20.7
44773	56.6	-11.0	ALL	DIRN.	SUR	551	0	0	18.6	-11.0	21.6
62517	50.6	-18.8	ALL	DIRN.	SUR	51	0	0	11.2	-15.5	19.1
62758	44.6	-23.9	ALL	DIRN.	SUR	77	1	1	19.6	-4.8	20.2
65599	59.3	-35.9	ALL	DIRN.	SUR	15	0	0	24.9	11.6	27.4

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures:		
Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s^{-1} Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	2990	1	31	2.0	0.0	2193	0	16	0	8.3	0.9
ACA	800	1	13	2.1	0.0	736	0	8	0	7.0	0.1
AEA	268	2	34	3.0	1.2	226	1	27	0	9.0	0.8
AEL	465	1	22	1.7	-0.5	474	0	22	0	9.6	0.6
AFL	378	0	6	2.1	0.8	355	0	3	0	8.2	0.4
AFR	1006	1	12	1.9	0.1	1010	0	10	0	8.3	1.2
AIH	117	2	13	1.8	0.2	110	0	6	0	9.8	1.7
AJM	54	0	4	2.4	-0.8	47	0	6	0	12.1	-1.7
AMT	25	0	16	2.0	0.2	25	0	16	0	9.0	3.1
AMX	188	3	6	1.9	0.2	188	1	4	0	9.9	0.7
ANZ	175	1	7	2.2	-1.2	172	0	7	0	8.2	0.5
AOM	261	1	5	1.7	0.8	263	1	5	0	10.1	0.1
AVA	146	1	5	2.1	-0.1	153	0	7	0	11.2	0.1
AZA	363	2	28	2.1	-0.3	293	0	18	0	8.0	0.6
BAL	485	0	20	1.5	-0.3	506	0	20	0	8.4	0.7
BAW	1724	0	24	2.1	0.0	1495	0	18	0	8.6	0.9
BWA	106	0	22	2.0	1.5	90	1	17	0	7.3	1.5
CDN	790	0	13	1.9	0.3	700	0	7	0	8.3	0.3
CFG	567	1	9	2.1	-1.1	550	0	7	0	9.4	0.8
CKT	93	1	22	1.8	1.0	82	1	18	0	10.9	-0.2
CLX	313	1	8	2.0	-0.7	284	0	5	0	7.8	0.8
CMM	389	0	10	1.6	-0.1	369	0	6	0	6.9	0.4
COA	805	0	26	2.1	0.0	638	0	18	0	12.7	2.8
CRL	185	0	2	1.3	0.4	183	1	4	0	8.6	0.7
CSA	44	2	18	1.3	-0.4	32	0	13	0	6.9	-0.8
CTB	320	0	2	1.8	-0.6	324	1	3	0	7.6	0.2
CTM	26	4	19	3.3	-1.8	26	0	12	0	9.0	0.4
CUB	232	2	14	2.3	1.0	231	0	12	0	9.9	0.2
DAF	20	0	0	1.6	-0.9	21	0	5	0	8.5	1.3
DAL	2028	1	32	2.0	-0.4	1526	0	21	0	9.3	0.5
DBY	134	0	2	1.7	-0.7	141	0	2	0	7.8	1.4
DHL	197	10	100	5.5	-3.7	163	0	16	0	11.1	2.3
DLH	2228	0	20	1.9	-0.1	1959	0	14	0	8.1	0.6
EIA	22	0	0	1.5	0.1	28	0	32	0	21.4	6.3
EIN	22	0	9	1.7	0.1	24	0	4	0	6.5	0.0
ELY	165	0	11	1.7	0.1	165	0	33	0	9.5	1.0
EWW	93	0	16	2.4	1.0	82	0	100	0	13.1	2.9
FDX	396	0	28	2.0	0.5	318	0	16	0	8.5	0.6
FIN	375	0	21	2.0	0.6	295	0	10	0	6.9	0.9
GAF	108	0	36	2.6	0.8	75	0	21	0	9.7	1.4
GRL	43	0	0	1.5	0.0	43	0	0	0	4.9	-0.8
GTI	36	0	25	1.6	0.5	28	0	14	0	11.2	-0.2
HLF	62	5	23	1.7	-1.1	57	0	16	0	9.7	-0.2
IBE	1339	1	28	2.0	0.4	1266	1	26	0	9.3	0.8
ICE	944	1	49	1.9	0.0	743	0	16	0	8.1	0.5
JKK	169	2	37	2.1	-0.1	135	0	27	0	8.8	1.9
KLM	2305	1	26	1.8	0.0	2184	0	25	0	8.6	0.5
LDA	74	0	31	1.6	-0.7	69	0	26	0	9.0	1.5
LDI	215	5	33	3.1	0.2	195	0	23	0	10.3	-0.2
LEI	113	1	16	1.7	0.3	100	0	7	0	7.6	1.3
LIB	92	0	4	1.7	1.1	95	1	6	0	8.2	0.2
LOT	188	0	20	2.4	-1.1	152	0	10	0	7.1	0.2
LTU	598	1	28	1.8	-0.2	495	0	19	0	9.1	0.8
LXR	87	0	21	1.7	0.9	85	1	31	0	13.9	2.2
MAS	91	1	16	2.1	0.5	78	0	8	0	7.4	1.9
MON	89	0	11	1.8	0.4	81	0	2	0	7.0	0.7
MPD	83	2	10	2.2	1.2	76	0	4	0	8.3	0.0
MPH	671	0	8	1.8	-0.6	637	0	5	0	7.9	0.3
NCA	23	0	0	1.1	0.1	20	0	0	0	6.8	2.0

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
NWA	1468	1	11	1.9	0.7	1344	0	5	0	7.7	0.3
OAL	29	3	31	3.2	1.7	23	0	17	0	11.3	-0.1
PAC	65	3	29	2.4	-0.1	50	0	16	0	7.2	0.9
RAM	47	0	4	2.1	0.3	47	0	2	0	9.0	0.5
RCH	148	2	30	2.0	0.2	130	0	23	0	10.5	0.1
RJA	39	3	28	3.4	0.7	32	0	19	0	10.1	-0.4
ROY	249	1	15	2.0	-0.3	228	0	11	0	9.6	0.5
RRR	139	1	22	2.0	-0.3	120	1	21	0	8.5	0.3
SAB	106	0	16	2.3	0.2	96	0	8	0	7.9	0.5
SAS	1085	1	2	1.7	-0.2	1072	0	3	0	7.8	0.0
SIA	135	0	8	2.6	-1.1	134	1	10	0	8.4	-0.2
SLR	85	4	20	1.5	-0.5	86	0	19	0	7.7	0.3
SSV	41	2	15	2.2	-0.6	34	3	9	0	5.7	1.1
SVA	112	0	5	1.8	-0.6	118	0	7	0	8.7	1.0
SWR	154	1	31	2.1	0.2	121	0	20	0	8.4	0.3
TAP	317	2	4	1.6	-0.2	313	0	4	0	9.4	0.5
TOW	171	1	29	2.2	-0.1	135	0	19	0	10.7	1.8
TSC	344	1	21	1.9	0.4	300	0	15	0	8.9	0.6
TWA	1128	1	37	2.4	0.6	805	0	24	0	8.9	0.9
UAL	1922	1	18	2.1	-0.2	1671	0	10	0	7.2	0.8
UPS	597	1	38	2.2	0.4	495	0	31	0	8.4	0.7
USA	318	0	31	1.9	-0.2	240	0	20	0	7.6	1.2
VIR	303	0	17	2.1	-0.3	271	0	10	0	8.8	1.1
VKG	57	2	5	2.1	0.9	57	2	5	0	8.0	1.3
WOA	27	0	7	2.0	0.3	27	0	7	0	9.0	3.7
BA	8321	1	13	1.6	0.1	8320	0	16	0	7.1	0.7
KL	3641	0	0	1.6	0.9	3641	0	28	0	6.7	0.7
LH	500	0	0	1.8	1.1	500	0	0	0	5.2	0.1
N	508	1	14	2.6	0.7	468	0	9	0	9.1	0.9
ADS	130	0	0	1.4	-0.4	130	0	100	0	5.4	0.9
US ACAR	14482	0	3	1.6	0.4	14479	0	1	0	7.1	0.8

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
C//S	00	Z	100	1	0	0.0	10.0	-10.0
CGDX	00	Z	100	1	0	0.0	26.0	26.0
DBBH	00	Z	100	11	0	10.2	10.3	-1.5
DBBH	12	Z	100	24	0	11.5	12.5	-5.0
DBLK	00	Z	100	1	0	0.0	9.0	9.0
DBLK	12	Z	100	10	0	20.9	27.0	17.1
ELML7	00	Z	100	12	0	14.4	14.6	-2.4
ELML7	12	Z	100	12	0	17.7	22.1	13.3
FNOR	00	Z	100	13	0	10.8	12.7	6.8
FNOR	12	Z	100	12	0	15.3	15.5	-2.8
FNOU	00	Z	100	13	0	13.7	14.8	-5.8
FNOU	12	Z	100	11	0	15.9	15.9	0.3
FNPH	00	Z	100	11	0	15.8	16.3	-4.2
FNPH	12	Z	100	12	0	15.3	17.1	-7.7
FNRS	00	Z	100	12	0	9.5	10.3	-3.9
FNRS	12	Z	100	11	0	11.4	11.5	-2.0
JBOA	00	Z	100	1	0	0.0	23.0	23.0
JGQH	00	Z	100	1	0	0.0	13.0	-13.0
LDWR	00	Z	100	28	0	15.3	16.1	-4.9
LDWR	12	Z	100	28	0	12.4	12.5	-1.8
OVYA2	00	Z	100	11	0	13.3	16.7	-10.2
OVYA2	12	Z	100	12	0	16.5	21.0	-12.9
OXYH2	00	Z	100	20	0	14.0	27.2	-23.3
OXYH2	12	Z	100	16	0	27.1	32.2	-17.3
SHIPS	00	Z	100	1	0	0.0	4.0	-4.0
V2VM	00	Z	100	18	0	9.7	10.5	-4.0
V2VM	12	Z	100	14	0	11.4	17.2	-12.9
V2XM	00	Z	100	9	0	18.5	24.3	15.7
V2XM	12	Z	100	9	0	13.7	19.7	14.2
ZDLP	00	Z	100	1	0	0.0	105.0	105.0
ZDLP	12	Z	100	1	0	0.0	112.0	112.0
03953	00	Z	100	27	0	16.3	17.7	6.9
03953	12	Z	100	27	0	10.5	13.0	7.7
04018	00	Z	100	23	0	12.9	14.6	-6.8
04018	12	Z	100	22	0	15.1	16.0	-5.3
04220	00	Z	100	4	0	4.3	8.4	7.3
04220	12	Z	100	11	0	11.1	14.3	9.0
04270	00	Z	100	28	1	12.9	17.0	-11.0
04270	12	Z	100	28	0	13.6	24.1	-20.0
04339	00	Z	100	23	0	10.7	11.0	2.7
04339	12	Z	100	17	0	9.2	11.0	6.1
04360	00	Z	100	26	0	9.3	9.6	2.4
04360	12	Z	100	27	0	16.6	17.0	3.8
08001	00	Z	100	19	0	13.4	15.3	-7.4
08001	12	Z	100	22	0	13.9	22.6	-17.8
08508	00	Z	100	1	0	0.0	4.0	4.0
08508	12	Z	100	14	0	18.4	27.7	-20.6
08522	00	Z	100	1	0	0.0	31.0	-31.0
08522	12	Z	100	2	0	17.5	17.7	-2.5
08594	00	Z	100	1	0	0.0	2.0	-2.0
08594	12	Z	100	15	0	16.1	17.5	6.9
60020	00	Z	100	16	0	9.8	9.9	-1.1
60020	12	Z	100	13	0	9.5	11.7	-6.7
71600	00	Z	100	28	0	10.6	10.8	2.2
71600	12	Z	100	29	0	8.5	11.2	-7.2
72201	00	Z	100	21	0	15.4	16.4	5.4
72201	12	Z	100	22	0	17.7	19.2	7.3
72402	00	Z	100	27	0	15.8	18.5	9.7
72402	12	Z	100	28	0	19.9	29.1	21.2
74494	00	Z	100	11	0	8.7	8.8	0.7
74494	12	Z	100	26	0	11.2	18.5	-14.8
78016	00	Z	100	25	0	12.6	12.6	0.5
78016	12	Z	100	27	0	14.4	14.8	-3.7

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
/BBH	12	Z	500	1	0	0.0	13.0	13.0
C//S	00	Z	500	1	0	0.0	3.0	-3.0
CGDX	00	Z	500	1	0	0.0	27.0	27.0
DBBH	00	Z	500	22	0	7.6	12.1	9.4
DBBH	12	Z	500	24	0	7.4	8.5	4.3
DBLK	00	Z	500	1	0	0.0	2.0	2.0
DBLK	12	Z	500	12	0	12.9	13.4	3.8
ELML7	00	Z	500	12	0	7.6	12.6	10.0
ELML7	12	Z	500	13	0	8.7	14.2	11.2
FNOR	00	Z	500	13	0	7.4	13.0	10.7
FNOR	12	Z	500	12	0	16.9	19.4	9.5
FNOU	00	Z	500	13	0	11.4	12.8	5.9
FNOU	12	Z	500	12	0	8.6	13.8	10.8
FNPH	00	Z	500	12	0	9.1	11.0	6.2
FNPH	12	Z	500	13	0	9.8	13.0	8.5
FNRS	00	Z	500	12	0	13.8	14.5	-4.3
FNRS	12	Z	500	12	0	5.9	7.0	3.8
JBOA	00	Z	500	1	0	0.0	4.0	4.0
JGQH	00	Z	500	1	0	0.0	16.0	-16.0
LDWR	00	Z	500	28	0	10.3	11.9	5.8
LDWR	12	Z	500	28	0	10.2	10.3	-1.1
OVYA2	00	Z	500	12	0	6.9	11.6	-9.3
OVYA2	12	Z	500	12	0	9.3	13.8	-10.2
OXYH2	00	Z	500	21	0	12.9	27.8	-24.6
OXYH2	12	Z	500	16	0	20.5	30.9	-23.1
SHIPS	00	Z	500	4	0	12.8	12.8	0.0
THNOG	00	Z	500	1	0	0.0	21.0	-21.0
V2VM	00	Z	500	20	0	9.2	9.3	-1.4
V2VM	12	Z	500	15	0	7.2	8.3	-4.1
V2XM	00	Z	500	11	0	22.6	25.3	11.4
V2XM	12	Z	500	9	0	22.3	24.4	9.8
ZDLP	00	Z	500	1	0	0.0	78.0	78.0
ZDLP	12	Z	500	1	0	0.0	80.0	80.0
03953	00	Z	500	29	0	11.4	15.9	11.1
03953	12	Z	500	29	0	9.2	11.5	6.8
04018	00	Z	500	28	0	9.2	10.6	5.4
04018	12	Z	500	28	0	10.1	10.3	2.1
04220	00	Z	500	29	0	10.9	11.8	4.3
04220	12	Z	500	29	0	9.0	9.0	0.6
04270	00	Z	500	29	0	20.7	21.9	-7.1
04270	12	Z	500	28	0	17.8	19.6	-8.2
04339	00	Z	500	28	0	8.4	9.8	5.1
04339	12	Z	500	28	0	9.4	9.8	2.5
04360	00	Z	500	27	0	11.1	11.1	-0.2
04360	12	Z	500	28	0	10.7	10.7	-0.4
08001	00	Z	500	28	0	11.6	15.5	10.3
08001	12	Z	500	28	0	13.2	14.0	-4.5
08508	00	Z	500	1	0	0.0	4.0	-4.0
08508	12	Z	500	25	0	8.5	12.1	8.6
08522	00	Z	500	1	0	0.0	10.0	-10.0
08522	12	Z	500	2	0	0.5	12.5	12.5
08594	00	Z	500	1	0	0.0	6.0	-6.0
08594	12	Z	500	17	0	8.0	10.0	5.9
60020	00	Z	500	27	0	9.5	11.2	6.0
60020	12	Z	500	28	0	10.1	12.0	6.6
71600	00	Z	500	28	0	15.0	15.1	-2.3
71600	12	Z	500	29	0	9.9	10.1	-1.9
72201	00	Z	500	23	0	4.7	8.3	6.9
72201	12	Z	500	24	0	10.4	10.8	3.0
72402	00	Z	500	28	0	10.6	11.8	5.3
72402	12	Z	500	28	0	16.0	16.1	-1.7
74494	00	Z	500	28	0	8.9	9.2	2.4
74494	12	Z	500	28	0	7.4	7.4	-0.1
78016	00	Z	500	25	0	10.2	17.5	14.2
78016	12	Z	500	27	0	10.0	15.1	11.3

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
C//S	00	V	100	1	0	0	0.0	-1.5	5.7
CGDX	00	V	100	1	0	0	0.0	-0.3	0.1
DBBH	00	V	100	5	0	0	0.0	-2.9	2.3
DBBH	12	V	100	22	0	0	0.0	2.1	-1.1
DBLK	00	V	100	1	0	0	3.8	-0.5	1.9
DBLK	12	V	100	11	0	0	3.8	1.5	-0.5
ELML7	00	V	100	11	0	0	2.1	-0.2	1.9
ELML7	12	V	100	12	0	0	5.0	2.2	0.5
FNOR	00	V	100	6	0	0	2.9	-0.9	-0.8
FNOR	12	V	100	7	0	0	2.9	0.6	0.5
FNOU	00	V	100	12	0	0	2.9	-0.8	-1.6
FNOU	12	V	100	10	0	0	3.9	0.5	0.4
FNPH	00	V	100	9	0	0	4.7	0.1	1.7
FNPH	12	V	100	8	0	0	4.7	0.9	0.1
FNRS	00	V	100	12	0	0	4.7	-0.3	-0.3
FNRS	12	V	100	8	0	0	1.7	-0.4	-1.1
JBOA	00	V	100	1	0	0	1.7	-0.6	0.2
JGQH	00	V	100	1	0	0	1.7	-2.3	-1.4
LDWR	00	V	100	28	0	0	5.4	0.0	-0.1
LDWR	12	V	100	28	0	0	2.0	0.4	-0.2
OVYA2	00	V	100	10	0	0	1.8	-0.7	1.1
OVYA2	12	V	100	11	0	0	1.5	-1.2	0.3
OXYH2	00	V	100	18	0	0	2.4	-1.4	1.8
OXYH2	12	V	100	11	0	0	4.0	-1.9	0.3
SHIPS	00	V	100	1	0	100	4.8	-2.6	-19.3
V2VM	00	V	100	16	0	0	4.0	-2.2	0.3
V2VM	12	V	100	12	0	0	2.8	-0.1	-0.5
V2XM	00	V	100	9	0	0	3.4	0.3	-0.1
V2XM	12	V	100	8	0	0	3.4	0.1	-1.0
03953	00	V	100	27	0	0	1.8	0.1	1.6
03953	12	V	100	26	0	0	2.1	-0.6	1.3
04018	00	V	100	17	0	0	2.5	0.7	1.2
04018	12	V	100	13	0	0	2.0	-1.8	0.6
04220	00	V	100	3	0	0	2.6	-1.7	2.8
04220	12	V	100	6	0	0	2.6	-2.4	0.4
04270	00	V	100	26	0	0	2.6	0.4	1.6
04270	12	V	100	23	0	0	2.6	-0.6	0.5
04339	00	V	100	17	0	0	2.4	-1.1	0.7
04339	12	V	100	16	0	0	3.5	0.7	-0.6
04360	00	V	100	26	0	0	2.4	-0.5	0.5
04360	12	V	100	25	0	0	2.0	0.7	0.6
08001	00	V	100	19	0	0	5.5	2.2	2.7
08001	12	V	100	13	0	0	3.3	1.7	0.8
08508	00	V	100	1	0	0	3.0	-2.1	-1.4
08508	12	V	100	10	0	0	3.0	-2.3	0.2
71600	00	V	100	26	0	0	2.9	0.3	0.8
71600	12	V	100	29	0	0	3.0	-0.5	0.3
72201	00	V	100	21	0	0	3.4	0.7	1.7
72201	12	V	100	22	0	0	2.9	1.1	-0.1
72402	00	V	100	27	0	0	1.3	-1.2	-0.1
72402	12	V	100	27	0	0	2.7	-0.9	0.9
74494	00	V	100	11	0	0	2.0	-1.3	1.8
74494	12	V	100	26	0	0	3.3	-1.2	1.1
78016	00	V	100	25	0	0	15.9	0.4	0.2
78016	12	V	100	27	0	0	2.6	0.6	1.3

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

```
 WMO   OBS                  NUM    NUM      %
IDENT  TIME  ELM   LEV     OBS   GROSS    REJ     RMS    UBIAS   VBIAS

/BBH    12    V    500      1      0     100     0.0    17.9    12.9
C//S    00    V    500      1      0       0     0.0     2.5    -0.6
CGDX    00    V    500      1      0       0     0.0     3.0     1.0
DBBH    00    V    500     18      0       0     0.0    -1.3     1.0
DBBH    12    V    500     22      0       0     3.9    -1.2     0.2

DBLK    00    V    500      1      0       0     3.2    -0.2    -2.6
DBLK    12    V    500     10      0       0     3.2    -1.2    -1.4
ELML7   00    V    500     12      0       0     2.4    -0.2     2.0
ELML7   12    V    500     12      0       0     3.6     0.4     1.8
FNOR    00    V    500      5      0       0     2.6    -1.2    -0.7

FNOR    12    V    500      6      0       0     2.6    -1.0    -1.2
FNOU    00    V    500     12      0       0     2.6    -0.5     0.9
FNOU    12    V    500     12      0       0     2.9    -1.0     1.7
FNPH    00    V    500     10      0       0     2.6     0.5     0.1
FNPH    12    V    500     10      0       0     3.5    -1.0     0.4

FNRS    00    V    500     12      0       0     3.2     1.9     0.7
FNRS    12    V    500     10      0       0     2.8    -1.5    -1.1
JBOA    00    V    500      1      0       0     2.8     0.8    -1.4
JGQH    00    V    500      1      0       0     2.8     1.4     0.1
LDWR    00    V    500     28      0       0     2.6    -0.3     0.1

LDWR    12    V    500     28      0       0     2.8     0.4    -0.1
OVYA2   00    V    500     12      0       0     2.9    -0.1    -0.6
OVYA2   12    V    500     12      0       0     3.1     0.5    -0.2
OXYH2   00    V    500     20      0       0     2.8    -0.6     1.9
OXYH2   12    V    500     15      0       0     5.1    -1.8    -0.2

SHIPS   00    V    500      4      0      25     5.5    -5.9   -11.8
THNOG   00    V    500      1      0       0     5.5     2.2     0.1
V2VM    00    V    500     18      0       0     2.6     0.7    -0.1
V2VM    12    V    500     16      0       6     3.4    -0.1    -0.5
V2XM    00    V    500     11      0       0     3.0     1.7    -0.6

V2XM    12    V    500      8      0       0     3.5    -0.4     0.2
03953   00    V    500     29      0       0     2.6     0.3    -0.9
03953   12    V    500     29      0       0     3.4     0.0    -1.2
04018   00    V    500     24      0       4     3.5     2.4     0.3
04018   12    V    500     24      0       0     3.1     1.2    -0.8

04220   00    V    500     26      0       3     3.5    -0.1    -0.2
04220   12    V    500     23      0       0     4.2     0.7     0.5
04270   00    V    500     27      0       0     3.6    -0.5     0.2
04270   12    V    500     27      0       0     2.7    -1.0     0.3
04339   00    V    500     24      0       4     3.0    -0.1     0.0

04339   12    V    500     28      0       0     4.8     0.8    -1.2
04360   00    V    500     27      0       0     4.0     0.3    -0.3
04360   12    V    500     27      0       0     2.5    -0.5     0.1
08001   00    V    500     28      0       0     3.2     0.2    -1.1
08001   12    V    500     22      0       0     2.9    -0.2    -0.2

08508   00    V    500      1      0       0     3.2    -1.7     2.1
08508   12    V    500     21      0       4     3.2    -0.7    -0.6
60020   00    V    500     11      0       0     3.1     0.2     0.6
60020   12    V    500     15      0       0     2.2     0.4     0.6
71600   00    V    500     26      0       0     2.4     1.1     0.7

71600   12    V    500     29      0       0     3.6     0.7    -0.4
72201   00    V    500     23      0       0     3.9     1.1    -0.4
72201   12    V    500     23      0       4     1.9    -0.1    -2.1
72402   00    V    500     28      0       0     1.8     0.9    -0.4
72402   12    V    500     28      0       0     3.2     1.3     0.4

74494   00    V    500     28      0       0     2.6     0.4    -0.1
74494   12    V    500     28      0       0     3.4     0.2     2.6
78016   00    V    500     25      0       0     5.7     0.5    -0.6
78016   12    V    500     27      0       0     3.2     0.6     0.3
```

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45